

medical conditions, and use of hormonal and nonhormonal medications. Relevant analyses examined the link between lifetime history of depression and abortion history. There were no significant differences between the proportion of women with a lifetime history of major depression (19.3%) who reported having one abortion and the proportion of women with no history of depression (17.9%) who reported having had one abortion. However, women with a lifetime history of depression were significantly more likely to report having had multiple abortions before their first onset of depression than were nondepressed women, controlling for age, age at menarche, educational attainment, and marital disruption. Direct comparisons between women reporting abortion versus delivery were not conducted. The researchers also reported a strong association between depression and marital disruption, underscoring the importance of controlling for marital status when seeking to assess the independent contribution of abortion to depression risk. The researchers pointed out that the higher proportion of women with multiple abortions found in the depressed versus nondepressed group may reflect a variety of antecedent conditions that were not assessed in the study, including involvement in abusive relationships. A particular strength of this study is its measurement of a clinically significant mental health disorder (depression) with established diagnostic criteria. In addition to the usual issues involved with a cross-sectional study that relies on retrospective self-report, study limitations include the possibility of a selective recall bias on the part of depressed women, and lack of information on pregnancy intention or wantedness, whether or not abortions were for therapeutic reasons, and women's exposure to violence.

*New Zealand Christchurch Health and Development Study.* The most comprehensive of the secondary analysis studies in terms of assessment of mental health outcomes was conducted in New Zealand (NZ). Fergusson et al. (2006) analyzed data from a 25-year longitudinal study of a cohort of children (including 630 females) born in 1977 in the Christchurch, NZ, urban region who were studied from birth to age 25 years. Information was obtained on (a) the self-reported reproductive history of participants from 15-25 years (abortion, delivery, or never pregnant); (b) measures of DSM-IV mental disorders (including major depression, overanxious disorder, generalized anxiety disorder, social phobia, and simple

phobia) and suicidal behavior for intervals 15-18, 18-21, and 21-25 years; and (c) childhood, family, and related confounding factors, including measures of child abuse.

In a series of concurrent analyses adjusting for covariates such as greater childhood social and economic disadvantage, family dysfunction, and individual adjustment problems in the abortion group, Fergusson et al. (2006) found that women in the abortion group had significantly higher rates of concurrent depression, suicidal ideation, illicit drug dependence, and total number of mental health problems than the delivery group. Concurrent analyses also indicated that except for alcohol and anxiety disorder, the abortion group had significantly higher rates of these disorders than the never pregnant group. More important, however, are the prospective analyses reported, as these capitalize on the longitudinal strengths of the study. The authors conducted a prospective analysis using reproductive history prior to age 21 years to predict total number of mental health problems experienced from 21-25 years (samples were too small to permit analyses by disorder). Controlling for covariates, the abortion group had a significantly higher number of disorders than the other two groups, which did not differ significantly from each other.

This study is unusual in the quality of measurement of the mental health variables, range of outcomes assessed, and number of co-occurring risk factors controlled. However, several design features limit conclusions that can be drawn from this study. First, neither wantedness nor intentionality of pregnancy was controlled. Second, women with multiple abortions were not separated from women with one abortion (21.6% of the abortion group had more than one abortion).<sup>2</sup> Third, as with other survey studies of this type, comparisons of reported abortions with population data suggest that abortion was underreported in this sample, although not to a great extent. Finally, differing abortion regulations between the United States and NZ also mean that caution should be used in generalizing from these studies to women in general in the United States.

In order to obtain a legal abortion in NZ, a woman must obtain the approval of two specialist consultants, the consultants must agree that either (1) the pregnancy would seriously harm the life or the physical or

mental health of the woman, (2) the pregnancy is the result of incest, (3) the woman is severely mentally handicapped, or (4) a fetal abnormality exists. An abortion will also be considered on the basis of the pregnant woman's young age or when the pregnancy is the result of rape.

**Evaluation of record-based and secondary analysis studies.** In weighing the evidence regarding abortion and mental health derived from the record-based and secondary analysis studies reviewed above, it must be kept in mind that the body of evidence is not as large as it appears. The 10 studies based on medical records are based on two data sets, one from the United States and one from Finland. The 15 studies based on secondary analyses of survey data are based on nine data sets, eight from the United States and one from New Zealand. Given that caution, what can be concluded from examination of these studies? An answer to that question requires considering their methodological quality.

*Problems of sampling.* First, many of the above studies cannot be generalized to the majority of women in the United States who seek abortions. Some are based on specialized data sets not representative of women in general (e.g., Coleman, Maxey, et al., 2005; Coleman, Reardon, et al 2005), some used screening criteria that eliminated a huge proportion of the larger sample (e.g., all of the Medi-Cal studies), some differentially excluded women from one outcome group but not the other (Reardon & Cougle, 2002a), and some were based on samples of women who obtained abortions under more restrictive regulations (Fergusson et al., 2006). Only one of the above studies based on survey data used sampling weights in its analyses (Coleman, 2006a). The study by Coleman (2006a), which did use sample weights, used a school-based population that did not include the most disadvantaged adolescents—those who dropped out of school to care for a child.

*Problems of comparison groups.* Although it is necessary to control for wantedness of pregnancy to assess a pregnant woman's mental health risks if she were to choose abortion compared to its alternatives, only three data sets (the NSFG, ADD-Health, and NLSY data sets) included questions about the intendedness or wantedness of pregnancy. Even when this information was available, it was not always used (Cougle et

al., 2003). In addition, interpretation of differences observed between the abortion and delivery groups was often compromised by differential exclusions from the delivery group.

*Problems in measurement of independent variables.* Other than the studies based on medical records, all of the studies reviewed above established abortion history through retrospective self-reports, raising serious reliability concerns. Few of the above studies took adequate steps to enhance the accuracy of reports of sensitive data. Thus, not surprisingly, abortion was underreported relative to national norms in all of the studies based on survey data. Furthermore, because none of these public data sets was designed specifically to identify the mental health effects of abortion compared with its alternatives, none provides adequate information about the characteristics of the abortion experience, such as the length of gestation at time of the abortion, age at which the abortion occurred, the reason for having the abortion (including medical reasons), and wantedness of the pregnancy. This information is not available for the medical record studies either. Such data are essential to understand the psychological implications of abortion.

*Problems in measurement of outcomes.* Studies based on secondary analysis of survey data typically did not use standard measures of mental health. Some studies were based on single-item measures of outcomes (e.g., Coleman, 2006a); others used an unvalidated measure of a psychological problem (e.g., Cougle et al., 2005) or only one or two measures of general psychological well-being (e.g., Russo & Zierk, 1992). Only two of the studies based on survey data (Fergusson et al., 2006; Harlow et al., 2004) used psychometrically strong assessments of clinically significant outcomes (i.e. a diagnosis). Further, in some cases, it was impossible to determine whether the "outcome" variable occurred prior or subsequent to the abortion (Coleman, 2006a; Cougle et al., 2005; Russo & Denious, 2001). Although less severe, there are problems with outcome measurement in the Medi-Cal data as well. Only one study (Gissler et al., 2004b) made an attempt to separate out therapeutic abortions from elective abortions, a distinction shown to be critical by the Finnish researchers.

*Confounds and co-occurring risks.* Researchers relying on secondary analysis of both medical records and survey

data collected for other purposes only have access to variables collected in those data sets. As a consequence, key variables that have documented relationships with both pregnancy outcome and mental health and which are thus potential confounders of any observed relationship between those variables may not be included in the data set. These include, for example, measures of prior substance abuse, prior or ongoing exposure to sexual abuse or partner violence, poverty, number of current children, number of prior unwanted pregnancies and prior unwanted births (both of which are correlated with number of abortions), and, most importantly, adequate measures of mental health prior to pregnancy. Only one of the 23 studies reviewed above (Fergusson et al., 2006) contained adequate measures of mental health prior to the pregnancy. In addition, with regard to the studies that focus on low-income populations (Medi-Cal studies, Washington study, Baltimore study), such populations are more likely to be in poor health, which itself is associated with psychological problems. Given that pregnant women who have serious illnesses such as diabetes, AIDS, and heart disease may be advised to have an abortion for health reasons, the correlation of abortion and physical and mental health problems might be expected to be higher in low-income populations.

*Problems with statistical analyses.* Large public data sets, particularly multiyear data sets, are complex and have an enormous number of variables from which to select for a particular analysis. As seen by the studies above that have published corrections of coding errors (e.g., Reardon & Cougle, 2002b; Schmiede & Russo, 2005), it is easy to make mistakes in the construction of variables. Moreover, it is important to have a conceptual rationale for selecting among the large number of potential variables. The variables researchers select to include in reanalyses of the original data reflect the interests (and sometimes the biases) of the researcher doing the reanalysis. The approach to the data analyses reflected in these studies is also of concern. Large numbers of statistical tests were often performed, increasing the probability of finding significant results when there was in fact no effect. The large sample sizes mean that effect sizes that are a statistically significant may be clinically meaningless. On the other hand, analyses were often based on small subgroups or subgroups for which no sample size was provided. In addition, results were frequently overinterpreted, with one significant finding emphasized over a num-

ber that were not significant or were in the reverse direction.

The selection of covariates in these studies also raised serious concerns. As noted above, the choice of covariates to include in analyses can play a key role in how much variance in the outcome variable is explained by pregnancy outcome. Given the large number of variables often assessed in these data sets, there is considerable room for researcher discretion in selection of covariates. Inclusion of covariates was often based on atheoretical preliminary analyses and often varied for unspecified reasons across analyses, even within the same study. In some studies, key covariates known to be associated with the outcome in question were omitted from the analyses despite their presence in the data set. For example, Reardon et al. (2004) used NLSY data to compare alcohol and drug use of women who aborted a first pregnancy to those who delivered their first pregnancy or were not pregnant. They did not control for history of drug use prior to the first pregnancy in their analyses, despite the availability of this information in the data set and despite prior published studies based on this same data set showing that use of drugs and alcohol predicted onset of early sexual activity (Rosenbaum & Kandel, 1990) and was uniquely predictive of subsequent premarital teen pregnancy as well as the decision to terminate a premarital teen pregnancy (Mensch & Kandel, 1992). As another example, in their analysis of the NSFG, Cougle et al. (2005) did not include items assessing rape history in their analysis, despite the presence of relevant items in the data set and publication of other studies (e.g., Reardon et al., 2002; Russo & Denious, 2001) suggesting that women who have abortions are at higher risk for rape and other forms of violence in their lives.

**Summary of medical-record and secondary analyses studies.** In sum, our careful evaluation of studies based on secondary analyses of medical records and existing public data sets revealed that in general they were methodologically quite poor. Problems of sampling, measurement, design, and analyses cloud interpretation. Because of the absence of adequate controls for co-occurring risks and prior mental health in these studies, it is impossible to determine whether any observed differences between abortion groups and comparison groups reflect consequences of pregnancy resolution or preexisting differences



between groups or methodological artifact. Consequently, these studies do not provide a strong basis for drawing conclusions regarding the relative risks of abortion compared to its alternatives.

#### **Comparison Group Studies Based on Primary Data**

Seventeen studies were conducted between 1990 and 2007 with the primary purpose of comparing women who had a first-trimester abortion (or an abortion in which trimester was unspecified) to a comparison group of other women on a mental health related variable. These studies resulted in 19 published papers. Details, key findings, and limitations of these studies are summarized in Tables 3a and 3b.

**Description of findings: U.S. samples.** Seven studies were based on U.S. samples. These studies are summarized in Table 3a. Cohan et al. (1993) examined responses of 33 women 1 month postpregnancy, 21 of whom had terminated their pregnancy and 12 of whom continued their pregnancy. Almost all had reported that their pregnancy was unintended. There were no significant differences between the 21 women who had terminated their pregnancy versus the 12 of those who continued their pregnancy on any of the outcomes assessed (positive and negative affect and decision satisfaction).

Lydon, Dunkel-Schetter, Cohan, and Pierce (1996) assessed initial commitment to a possible pregnancy as well as positive affect and negative affect (Derogatis, 1975) among women just prior to obtaining a pregnancy test at health clinics in the United States and Canada. For the women who received a positive pregnancy result, these variables were reassessed within 9 days (T2) and again at 4–7 weeks (T3) after learning of the positive test result. By the T3 follow-up, 30 women had terminated their pregnancy, and 25 had decided to continue their pregnancy. Initial commitment to the possible pregnancy (assessed at T1) interacted with outcome decision (abort vs. deliver) to predict affect at T3. Among women continuing their pregnancy, those high ( $N=11$ ) and low ( $N=12$ ) in initial commitment to the pregnancy did not differ significantly in affect at T3. Both expressed more positive than negative affect. Among women who had aborted their pregnancy, those who had been initially less committed to the possible pregnancy ( $N=13$ ) did not differ significantly in affect from those deciding to continue their pregnancy. They too expressed more positive than negative affect.

The women who had initially indicated somewhat more commitment to the possible pregnancy but who decided to terminate the pregnancy ( $N=14$ ) reported significantly less positive affect and significantly more negative affect than the other three groups. A particular strength of this study is its tracking of commitment and affective state over the time course of first learning of a pregnancy and its resolution. Other strengths are its strong theoretical framework and good measurement of predictor variables. Limitations include the very small sample sizes and absence of measures of clinically significant mental health outcomes.

The remaining four U.S. studies measured abortion history through retrospective self-reporting (see Table 3a). Felton, Parsons, and Hassell (1998) found no significant differences on overall health-promoting behaviors, appraisals of problem-solving effectiveness, or global self-image between 26 adolescents attending a family planning clinic who reported a history of abortion and 26 demographically matched adolescents who reported never being pregnant. Williams (2001) found no significant differences on any of the subscales of the Grief Experience Inventory between 45 women waiting to see their health care provider who reported a history of abortion and 48 demographically similar women who reported no elective abortions. Medora et al. (1993) found that among a sample of 121 single, never married, pregnant teenagers, the 28 girls who reported a prior abortion had significantly higher self-esteem than the 93 girls who reported no abortion history. Medora and von der Hellen (1997) reported that among a sample of 94 teen mothers, teens who reported a prior abortion did not differ in self-esteem from teens who did not report an abortion (number in each group was not specified). The only U.S. study to report that an abortion group had a poorer outcome than a comparison group was conducted by Reardon and Ney (2000). This study was based on a reproductive history questionnaire mailed to the homes of a large sample of women, only 14.2% of whom responded. In analyses restricted to White women, women who reported having had at least one induced abortion ( $N = 137$ ) were more likely than women who reported having had no abortions ( $N = 395$ ) to also agree with a single yes/no question: "Have you ever abused drugs or alcohol?"

**Description of findings: Non-U.S. samples.** Nine studies were based exclusively on non-U.S. samples. Most were methodologically quite poor (see Table



3b). The most methodologically sound papers were based on a study conducted by Broen and colleagues in Norway (Broen, Moun, Bodtger, Ekeberg, 2004, 2005, 2006) and one conducted jointly by the Royal College of General Practitioners and the Royal College of Obstetricians and Gynecologists in the United Kingdom (Gilchrist et al., 1995).

The study by Broen and colleagues followed two groups of Norwegian women from 10 days to 5 years after a first-trimester induced abortion ( $N = 80$ ) or early miscarriage ( $< 17$  weeks;  $N = 40$ ). Experiences of anxiety and depression, avoidance, intrusion stress reactions (assessed with the Impact of Events scale), subjective well-being, and feelings about the pregnancy termination were assessed at four intervals post abortion. Comparisons between the miscarriage and induced abortion groups, controlling for potential confounders, revealed no significant differences between the two groups in mean anxiety or depression scores or subjective well-being scores at any time point. Women who had an induced abortion reported feeling more guilt, shame, and relief and also more avoidance on the IES scale than women who miscarried. Women who miscarried reported more feelings of grief and loss than those who had an induced abortion in the short term, but this difference disappeared by 5 years post event.

Strengths of this study included its repeated and long-term follow-up, attempt to control for prepregnancy mental health (although this was assessed retrospectively via self-report and psychiatric evaluation post abortion), use of established and reliable outcome measures, and high retention rate (91%), although only 47% of those initially approached agreed to participate in the study. This study is useful for comparing grief reactions among different forms of pregnancy loss. However, the comparison group used in this study is inappropriate for drawing conclusions about the relative risks of abortion versus its alternatives. A spontaneous miscarriage of a (wanted) pregnancy is not an alternative for women faced with a decision about how to resolve an unintended or unwanted pregnancy.

The strongest study reviewed (Gilchrist et al., 1995) was prospective and longitudinal and employed a large sample size, appropriate comparison groups of women with unplanned pregnancies, and a long

postpregnancy/abortion follow-up time. Importantly, this study also controlled for mental health prior to the pregnancy as well as other covariates. Women's medical, psychiatric, and obstetric history prior to the pregnancy was recorded from their medical records or the recruiting physicians' case notes. The final sample consisted of four pregnancy outcome comparison groups: (a) 6,410 women who obtained terminations (85% occurred before 12 weeks of gestation), (b) 6,151 women who did not seek termination, (c) 379 who requested termination but were denied, and (d) 321 who requested termination but changed their mind.

Postdelivery/abortion psychiatric morbidity was assessed using established diagnoses and grouped into three categories in order of severity: (a) psychosis, (b) nonpsychotic illness (e.g., depression, anxiety), and (c) deliberate self-harm (DSH) without other psychiatric illness (e.g., drug overdoses). Similarly, prepregnancy psychiatric history was classified into four categories in order of severity: (a) psychotic episode, (b) nonpsychotic illness, (c) DSH without other psychiatric illness, and (d) no psychiatric illness. The two largest subgroups of prepregnancy history were women with no prepregnancy history of psychiatric problems or DSH prior to the pregnancy (2476 women) and women with a history of nonpsychotic illness (1100 women), followed by women with a history of psychosis ( $N=106$ ) and women with a history of DSH alone ( $N=36$ ). Differences between the delivery reference group and each of the other three comparison groups were examined within each of the four categories of prepregnancy psychiatric history. Age, marital status, smoking, education level, gravidity, and prior history of abortion were controlled in analyses that focused on the overall rate of postpregnancy psychiatric morbidity as well as the rate of each of the three postpregnancy diagnoses among the four comparison groups.

Among women with equivalent past psychiatric histories, there were no significant differences between the four comparison groups in overall rates of psychiatric illness. Rates of specific postpregnancy psychiatric illnesses, however, differed among the comparison groups depending on prepregnancy diagnostic history and diagnostic outcome as follows: (1) With respect to postpregnancy nonpsychotic illness, no significant differences were found between abor-



**Table 3A: Primary Data Comparison Group Studies  
UNITES STATES SAMPLES**

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Cohan, C.L., Dunkel-Schetter, Christine, & Lydon, J. (1993). Pregnancy decision making: Predictors of early stress and adjustment. <i>Psychology of Women Quarterly</i> , 17, 223-239.	U.S. Recruited at health clinic prior to pregnancy testing (88% response rate). Pregnancy intendedness and outcome intentions assessed prior to learning outcome. 81% indicated pregnancy was unintended. 33 of the 44 who were pregnant completed questionnaires at two points: (24 hrs post-Pg test outcome & 1 month post-Pg test outcome). Of the 33, 21 had an abortion & 12 carried to term. Criteria for participation: 18 yrs or older & English speaking.	Fifteen women who initially intended to abort and did so (decided aborters) and 6 women who were initially undecided and later aborted (undecided aborters) were compared to 10 women who initially intended to carry to term and did so.	Positive and negative affect (Affect Balance scale). Decision satisfaction (single item).	One month post-test, there were no significant differences in either positive or negative affect between women who aborted (both initially decided and undecided) vs. those who continued their pregnancy. Women committed to carrying their pregnancy to term were marginally more satisfied with their decision than both abortion groups, who did not differ from each other. Overall, women who aborted were satisfied with their decision.	Extremely small sample sizes. Single-item measure of decision satisfaction. Analyses do not control for whether pregnancy was intended or not. No measures of pre-pregnancy mental health.
Felton, G.M., Parsons, M.A., & Hassell, J.S. (1998). Health behavior and related factors in adolescents with a history of abortion and never pregnant adolescents. <i>Health Care for Women International</i> , 19, 37-47.	U.S. 26 adolescents (age 16-19) attending education classes at publicly supported family planning clinics who reported a history of abortion on questionnaires. Criteria for participation: never married, not currently pregnant, never gave birth, and completion of 9th grade.	Twenty-six never-pregnant adolescents matched to abortion group on age, race, education, & Medicaid status. Two groups also similar on age at first coitus and patterns of contraceptive use.	Healthy lifestyle (Health Promoting Lifestyle Profile). Perceived effectiveness of problem solving (Problem Solving Inventory). Adjustment (Offer Self-Image Questionnaire)	No significant difference between abortion and never-pregnant groups on overall health-promoting behaviors, appraisals of problem-solving effectiveness, and global self-image. Both groups' scores on the Offer Self-Image Questionnaire were also compared to normed reference group scores. Adolescents with history of abortion scored below the norm on 10 out of 12 areas of adjustment; never-pregnant adolescents scored below the norm on 8 out of 12 areas of adjustment.	Abortion history retrospectively self-reported. No information about recruitment strategy, response rate, sample representativeness, or abortion context (e.g., timing, gestation, age, etc.). Extremely small sample size. Comparison group not appropriate. No measures of pre-pregnancy mental health.

tion and delivery groups, irrespective of prepregnancy diagnostic history. (2) With respect to post-pregnancy psychoses, women who had an abortion were significantly less likely to have a postpregnancy psychotic episode than those who delivered among

the subgroup of women with no prepregnancy history of psychotic illness (1.1 vs. 4.1) and among the subgroup of women with a history of nonpsychotic illness (4.9 vs. 11.8). A similar, but nonsignificant pattern was observed among the subgroup of women



**Table 3A: Primary Data Comparison Group Studies**  
**UNITES STATES SAMPLES** (continued)

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Lydon, J., Dunkel-Schetter, C., Cohan, C. L., Pierce, T. (1996). Pregnancy decision making as a significant life event: A commitment approach. <i>Journal of Personality and Social Psychology</i> , 71, 141-151.	U.S. and Canada. Recruited at health clinics prior to pregnancy testing (90% response rate). Pregnancy intendedness, wantedness, meaningfulness, commitment, concerns, and positive and negative affect assessed prior to learning Pg test outcome (T1). 85 women tested positive; 57 of whom completed interviews within 9 days of test result (T2) and within 4-7 wks of test result (T3). 30 had abortion prior to T3; 25 continued Pg, 2 had abortion after T3 follow-up. Criteria for participation: 18 yrs or older, English speaking in U.S. Eng or French in Canada.	Thirty women who aborted and 25 women who carried to term were divided by high vs. low early commitment to pregnancy at T1 and compared on affect balance at T2 and T3.	Negative affect (anxiety, guilt, depression, hostility) and positive affect assessed with Affect Balance Scale (Derogatis, 1975). Affect Balance (ave pos emo minus ave neg emo) as measure of emotional adjustment.	Initial commitment at T1 interacted with outcome decision (abort vs. deliver) to predict affect at T3. Among women continuing Pg, those high (N=11) and low (N=12) in initial commitment to Pg had equal pos affect at T3. Among women who aborted Pg, those less committed initially to Pg (N=13) did not differ in pos affect from those continuing Pg. Those somewhat more committed to Pg initially (N=14) had less sig pos affect and more neg affect than those continuing Pg.	Strength of study is tracking of commitment and affect over time during course of pregnancy decision; good theoretical framework, good measurement of predictors. Limitations include small sample size, high attrition. Outcome measure not clinically significant.
Medora, N. P., Goldstein, A., & von der Hellen, C. (1993). Variables related to romanticism and self-esteem in pregnant teenagers. <i>Adolescence</i> , 28, 159-170.	U.S. 28 pregnant teenagers who were single, never married, and enrolled in a pregnant minor program or residing in a maternity home, who reported a prior abortion history on a questionnaire.	Ninety-three pregnant teenagers who were single, never married, and in same pregnant-minor program or maternity home, who reported no abortion history.	Self-esteem (Bachman Self-Esteem scale)	Pregnant teens who reported a prior abortion had higher self-esteem than pregnant teens who reported no prior abortion	Abortion history retrospectively self-reported. No information about abortion context (e.g., timing, gestation). Small sample size. Sample not representative. Comparison group not appropriate. No measures of pre-pregnancy mental health.
Medora, N. P. & von der Hellen, C. (1997). Romanticism and self-esteem among teen mothers. <i>Adolescence</i> , 32, 811-814.	U.S. Full sample consisted of 94 teen mothers enrolled in a teen mother program affiliated with a high school in Southern CA. Ages 13-18 yrs. 51 (54%) Latino, (23%) African American, (18%) Anglo, (4%) were Asian. Unspecified number of girls in sample reported prior abortion.	Unspecified number of girls in sample who did not report a prior abortion.	Self-esteem (Bachman Self-Esteem Scale)	No significant difference in self-esteem between teen mothers who reported an abortion and teen mothers who did not.	No information about number of teen mothers who did and did not abort; abortion history retrospectively self-reported. No information about abortion context (e.g., timing, gestation). Small sample size. Sample not representative. Comparison group not appropriate. No measures of pre-pregnancy mental health.



**Table 3A: Primary Data Comparison Group Studies**  
**UNITES STATES SAMPLES** (continued)

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Reardon, D. C. & Ney, P. G. (2000). Abortion and subsequent substance abuse. <i>American Journal of Drug and Alcohol Abuse</i> , 26, 61-75.	U.S. Reproductive history questionnaire sent to a national sample of 4929 women between ages of 24 and 44, selected randomly from "national mailing list house database." 700 completed forms returned (14.2%; 94% of respondents White). One hundred and fifty-two women reported having at least one induced abortion. Analyses restricted to White women who aborted (N=137).	Comparison group of 395 White women who reported no abortions	Single item measure: "Have you ever abused drugs or alcohol?" yes/no	Significant positive association observed between self-reported abortion history and self-reported substance abuse. Among white women, 65% who reported a history of substance abuse identified the onset as occurring prior to age at first pregnancy.	Abortion history retrospectively self-reported. Extremely low response rate. Sample not representative of U.S. women. Abortions underreported compared to national statistics. No information about context of abortion. Single item, dichotomous dependent measure not a valid indicator of substance abuse. Response bias likely, i.e., women willing to report one socially sanctioned action (abortion) may be more willing to also report another (substance abuse). Inappropriate comparison group. Many tests of significance conducted, capitalizing on chance. Analyses performed on extremely small subsets of women (e.g., N's <5). No measures of pre-pregnancy mental health.
Williams, G. B. (2001). Short term grief after an elective abortion. <i>Journal of Obstetric, Gynecologic, and Neonatal Nursing</i> , 30, 174-183.	U.S. 45 women (ave age 23 years) waiting to see their health care provider in a gynecological clinic who reported a history of one or more abortions on a questionnaire. Exclusion criteria included a perinatal loss of a non-voluntary nature within the past 5 years, a prior abortion for medical reasons, or a documented psychiatric history.	Forty-eight women who completed same questionnaire under same circumstances but who reported no abortion history. There were no significant differences between the two groups in age, ethnicity, marital status, education, income, or religion.	Grief (Grief Experience Inventory).	There were no significant differences between the abortion groups and no abortion groups on any of the 12 clinical scales of the Grief Experience Inventory.	Abortion history retrospectively self-reported. No information about response rate or representativeness of the samples was provided. Small sample size. Comparison group not appropriate. No measures of pre-pregnancy mental health.

Notes: AB = Abortion DEL = Delivery; Pd = pregnancy; ACOG = American College of Obstetricians and Gynecologists; ICD = International Classification of Diseases; Grp = Group; Sig = Significance



**Table 3B: Comparison Group Studies  
NON-U.S. SAMPLES**

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Bailey, P.E., Bruno, Z.V., Bezerra, M.F., Queiroz, I., Oliveira, C.M., & Chen-Mok, M. (2001). Adolescent pregnancy 1 year later: The effects of abortion vs. motherhood in northeast Brazil. <i>Journal of Adolescent Health</i> , 29, 223-232.	Brazil. 125 adolescents admitted to hospital for complications from illegal induced abortion interviewed before discharge. 95 interviewed 1 year postabortion. Criteria for participation: 18 or younger, never gave birth but not necessarily first Pg, within 21 weeks of gestation for aborters U.S. 28 pregnant teenagers who were single, never married, and enrolled in a pregnant-minor program or residing in a maternity home, who reported a prior abortion history on a questionnaire.	Cohort of 367 pregnant teens who sought prenatal care at the same hospital.	Self-esteem (Rosenberg Self Esteem scale). Percent enrolled in school one year later.	Lower percent of teens with high self-esteem among induced abortion group both before discharge and one year later than among teens with intended or unintended pregnancies. Teens in abortion group were 6.9 times more likely to be enrolled in school 1 year later than teens with intended pregnancies.	Sample not generalizable to U.S. Abortion is illegal in Brazil unless pregnancy results from rape or places woman's life at risk. Sample was recruited from women experiencing medical complications from an illegal abortion. Comparison group (teens carrying to term) does not control for wantedness of pregnancy. No measures of pre-pregnancy mental health.
Barnett, W., Freudenberg, N., & Wille, R. (1992). Partnership after induced abortion: A prospective controlled study. <i>Archives of Sexual Behavior</i> , 21, 443-455.	Germany. Ninety-two women seeking abortion for socially indicated reasons (without medical indication) were interviewed prior to and 1 year post abortion. All were referred to the study by their gynecologists and were in a stable relationship with their partner. None had an abortion during the previous year.	Comparison group of 92 women drawn randomly from each gynecological practice who were in a stable relationship, were using safe contraceptives, had not had abortion in prior year, and did not desire a child. They were matched to abortion group on marital status, age, number of children, duration of partnership, and educational background. They were interviewed at the same two time points.	Quality of relationship with partner prior to and 1 year post abortion: Affection, conflict behavior, and mutual interests (Partnership Questionnaire); Mutual trust (Interpersonal Relationships scale); Percent separated from partner at one year; Satisfaction with sex life.	At Time 1 (preabortion), relationships of abortion group were of poorer quality (more conflict, less affection, less trust) than control group. At Time 2 (one year postabortion), there were no differences between abortion and control group in relationship quality, mutual trust, percent separated, or satisfaction with sex life.	Only women in stable relationships included in study. No measures of pre-pregnancy mental health. Some initial differences between abortion and control group (a higher percent of abortion group were working class and reported marital disharmony in childhood). Comparison group (not pregnant) not appropriate.



**Table 3B: Comparison Group Studies  
NON-U.S. SAMPLES**

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
<p>(1) Broen, A., Moum, T., Bodtker, A. S., &amp; Ekeberg, O. (2004). Psychological impact on women of miscarriage versus induced abortion: A 2-year follow-up study. <i>Psychosomatic Medicine</i>, 66, 265-271.</p> <p>(2) Broen, A., Moum, T., Bodtker, A. S., &amp; Ekeberg, O. (2005a). The course of mental health after miscarriage and induced abortion: A longitudinal five-years follow-up study. <i>BioMed Central Medicine</i>, 3, 18.</p> <p>(3) Broen, A., Moum, T., Bodtker, A. S., &amp; Ekeberg, O. (2006). Predictors of anxiety and depression following pregnancy termination: A longitudinal five-year follow-up study. <i>Acta Obstetrica et Gynecologica</i>, 85, 317-323.</p>	<p>Norway. Recruited women (age 18-45) in hospital for induced abortion (&lt; 13 weeks; none due to fetal abnormality) (N=80) or miscarriage (&lt; 17 weeks). (N=40). Women in both groups were interviewed 10 days (T1), 6 months (T2), 2 years, (T3) and 5 years (T4) post event. 91% of sample retained over 5 years. Data are reported in 3 papers.</p>	<p>Comparison group of women in hospital for miscarriage (&lt;17 wks); N=40</p> <p>General Norwegian population norms for anxiety and depression (HADS).</p> <p>AB group had more children, were less likely to be married, more likely to be students, and had poorer mental health than miscarriage group prior to abortion or miscarriage. Women's psychiatric health prior to pregnancy assessed post-event by combined self-report and diagnostic evaluation by interviewer.</p>	<p>Stress reactions (Intrusion and avoidance, assessed with Impact of Event Scale). Feelings about pregnancy termination (7 items); anxiety and depression (Hospital Anxiety and Depression Scale-HADS). Subjective well-being (Quality of Life Scale).</p>	<p>Miscarriage group (MIS) reported more IES intrusion than abortion group (AB) at T1 only. AB reported more IES avoidance at T1, T2, T3 and T4. Quality of life scores did not differ between MIS and AB groups and improved over the course of the study. MIS group reported more feelings of grief at T1, T2, and T3, and more feelings of loss at T1 and T2 than AB group. AB group reported more relief and shame at all time points, and more guilt at T2, T3, and T4. HADS scores did not differ between MIS and AB groups at any time point when potential confounders were controlled. AB group had higher anxiety than general population norms at all time points. Both groups scored higher than general population in depression at T1 but not at T3 or T4. Recent life events and former psychiatric health were important predictors of anxiety and depression among AB group.</p>	<p>Low participation rate (47%). Comparison group (miscarriage) does not control for intendedness of pregnancy. Small sample sizes. "Pre-pregnancy" psychiatric health assessed post abortion or miscarriage. Abortion history retrospectively self-reported. No information about response rate or representativeness of the samples was provided. Small sample size. Comparison group not appropriate. No measures of pre-pregnancy mental health.</p>
<p>Bradshaw, Z., &amp; Slade, P. (2005). The relationships between induced abortion, attitudes towards sexuality and sexual problems. <i>Sexual and Relationship Therapy</i>, 20, 391-406.</p>	<p>United Kingdom. Ninety-eight women attending a pre-abortion meeting at a clinic for a first-trimester abortion asked about attitudes toward sex and sexual problems in the 2 months prior to their pregnancy and after learning of their pregnancy. 44 responded to the same questionnaires 2-months post-abortion.</p>	<p>Comparison group of 51 women attending a health center who had been in a sexual relationship over the last 3 months, who were not pregnant, and who had not had an abortion in the last 5 years completed same questionnaires once.</p>	<p>Attitudes toward sex (Sexual Opinion Survey); sexual problems (Go Lombok Rust Inventory of Sexual Satisfaction - GRISS).</p>	<p>Abortion group and comparison group did not differ in attitudes toward sex or sexual problems (assessed retrospectively for abortion group).</p>	<p>Low recruitment rate (45%) and retention rate (46%) in abortion sample. Inappropriate comparison group. No comparisons made on post-abortion measures. Women's retrospective reports of their sexual attitudes and problems "pre-pregnancy" are unreliable.</p>



**Table 3B: Comparison Group Studies  
NON-U.S. SAMPLES**

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Conklin, M.P., & O'Connor, B.P. (1995). Beliefs about the fetus as a moderator of postabortion psychological well-being. <i>Journal of Social and Clinical Psychology</i> , 14, 76-95	Canada. Participants recruited from waiting rooms of physicians' offices and asked to complete a questionnaire. 153 out of 817 who completed questionnaire reported at least one abortion.	Six hundred and sixty-four women who reported no abortion history on questionnaire.	Self-esteem (Rosenberg self-esteem scale); positive and negative Affect (Positive and Negative Affect schedule); life satisfaction (Satisfaction with Life Scale). Beliefs about the humanness of the fetus (7-item scale—reliability not provided).	There were no differences on any outcome variable between women who reported having an abortion and women who reported no abortion once marital status was controlled. Belief in the humanness of the fetus moderated responses. Women who had an abortion and attributed humanness to the fetus had lower self-esteem, more negative affect, and lower life satisfaction than women who reported no abortion. Women who had an abortion but who did not attribute human qualities to the fetus did not differ on any outcome variable from women who did not have an abortion.	Abortion history retrospectively self-reported. No information about abortion context. No information about response rate or sample representativeness. Comparison group not appropriate. No measures of pre-pregnancy mental health.

with a history of psychosis (28.2 vs. 35.2).<sup>3</sup> (3) Findings with regard to the outcome of deliberate self-harm (DSH) were mixed. Rates of DSH did not significantly differ for abortion versus delivery groups among the categories with the highest DSH rates—women with a past history of psychosis (18.2 vs. 19.3) or past history of DSH (8.4 vs. 13.5). Among women with no previous psychiatric history, however, DSH was significantly higher among women who were refused an abortion (5.1) or who had an abortion (3.0) compared with those who delivered (1.8). Most DSH episodes (89%) were drug overdoses; none were fatal. In sum, the authors concluded that, “Rates of total reported psychiatric disorder were no higher after termination of pregnancy than after childbirth.” Further, they noted that women with a history of previous psychiatric illness were most at risk, irrespective of the pregnancy outcome.

#### **Evaluation of primary data comparison group studies.**

Conclusions that can be drawn from these studies are limited by the methodological problems that characterize the vast majority. Below, we briefly summarize the nature of these problems.

*Sampling problems.* Most of the studies had one or more sampling problems. Most were based on small sample sizes (fewer than 100 women). Many provided little or no information about the sample recruitment strategy, response rates, or sample representativeness or were based on a sample that clearly is not representative of the population of women who obtain abortions (e.g., Reardon & Ney, 2000). Only six of these studies were conducted in the United States, raising concerns about generalizability. The rest were conducted in Canada (3), the United Kingdom (3), Norway (1), Germany (1), Israel (1), and Brazil (1). The abortion regulations and sociocultural context of



**Table 3B: Comparison Group Studies  
NON-U.S. SAMPLES**

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Gilchrist, A. C., Han-naford, P. C., Frank, P., & Kay, C. R. (1995). Termination of pregnancy and psychiatric morbidity. <i>British Journal of Psychiatry</i> , 167, 243-248.	United Kingdom. Prospective cohort study of 13,261 women with unplanned pregnancies. One thousand five hundred and nine volunteer GPs asked to recruit all women who requested a termination of a pregnancy and a comparison group of women who did not request termination but whose pregnancy was unplanned. Women were enrolled between 1976 and 1979 and were followed every 6 months until they left the study or end of study (1987). Final sample consisted of 6410 who obtained termination.	Comparison groups included 6151 women who did not seek termination, 379 who requested termination but were denied, and 321 who requested termination but changed mind. For purposes of analyses, each comparison group was divided into four subgroups according to severity of previous psychiatric history (assessed at study recruitment): psychosis, nonpsychotic illness, deliberate self-harm alone, and no psychiatric illness or self-harm. Data also standardized (i.e. covariate adjustment) for age, marital status, smoking, education level, gravidity and prior history of abortion.	Psychiatric morbidity coded by GP using ICD-8 diagnostic categories: psychoses; nonpsychotic illnesses (depression, anxiety), and episodes of deliberate self-harm (DSH)	In women with equivalent past psychiatric histories, there were no significant differences between the comparison groups in overall rates of psychiatric illness. Risk of psychotic illness and risk of nonpsychotic illnesses did not differ between termination and nontermination groups. Rates of DSH did not differ by pregnancy outcome among women with a past history of psychosis or DSH. Among women with no previous psychiatric history, DSH was higher among women who had an abortion or who were refused an abortion. Conclusion: "Rates of total reported psychiatric disorder were no higher after termination of pregnancy than after childbirth." Abortion group and comparison group did not differ in attitudes toward sex or sexual problems (assessed retrospectively for abortion group).	Analyses did not differentiate between terminations carried out at < 12 weeks (85%) vs. over 12 weeks (15%) gestation. Sampling by GP recruitment may have led to nonrepresentative sample. GPs may underrecognize or imprecisely diagnose psychiatric disorder.
Houston, H., & Jacobson, L. (1996). Overdose and termination of pregnancy: an important association? <i>British Journal of General Practice</i> , 46, 737-738.	United Kingdom. Authors examined all medical records of female patients aged 15-34 years inclusive within their practice in 1994 to examine whether there was an association between drug overdose and induced termination of a pregnancy (excluding pregnancy for fetal abnormality or maternal illness).	Out of 1359 patients, 163 (12%) had an abortion history, and 47 (3.5%) had a history of a deliberate overdose. Fifteen women had a history of both events.	Drug overdose requiring hospital treatment (excluding accidental overdose).	The association between overdose and termination was significant. More terminations tended to follow overdose than the reverse.	No details known about context of abortion, reasons for termination, marital status or other characteristics of women. Representativeness of sample unknown. Presence of significant association does not establish causation. No measures of pre-pregnancy mental health.



**Table 3B: Primary Data Comparison Group Studies**  
**NON-U.S. SAMPLES** (continued)

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Lauzon, P., Roger-Achim, D., Achim, A., & Boyer, R. (2000). Emotional distress among couples involved in first-trimester induced abortions. <i>Canadian Family Physician</i> , 46, 2033-2040.	Canada. Recruited women having a 1st trimester abortion at one of 3 public abortion clinics. Excluded if under 15 years of age or pregnancy result of rape or incest. 197 women completed questionnaires prior to abortion. 127 completed questionnaires 1-3 weeks postabortion.	Comparison group of 728 women (aged 15-35 years) who had taken part in a previous public health survey and completed same outcome measure. Compared to control group, abortion group was significantly younger, less educated, less likely to be living with a spouse, less likely to have children, more likely to be students, more likely to be divorced, separated or single, and more likely to have had suicidal ideation or suicide attempts prior to the abortion. Abortion history unspecified.	Psychological distress. (Ilfeld Psychiatric Symptom).	Before the abortion, 56.9% of women were more distressed than comparison group. Three weeks after abortion, 41.7% of women more distressed than comparison group. Predictors of distress prior to abortion were past history of suicidal ideation, fear of negative effects on relationship, unsatisfactory relationship, and no previous child.	Sample representative-ness unknown. One third of subjects lost to attrition. Very short follow-up period. Comparison group inappropriate. Abortion group differed from comparison group in ways that may fully account for any differences observed post-abortion. No significance tests reported for differences between abortion and comparison group. No measures of pre-pregnancy mental health.
Ney, P.G., Fung, T., Wickett, A.R., & Beaman-Dodd, C. (1994). The effects of pregnancy loss on women's health. <i>Social Science &amp; Medicine</i> , 38, 1193-1200.	Canada. Asked 238 family physicians to hand out questionnaires to the first 30 women of child bearing age who walked into their offices in a given week; 69 physicians provided usable questionnaires from 1428 women. Women were asked questions about their health, family life, enjoyment of being a parent, the supportiveness of their partner, and the outcomes of up to nine pregnancies.	The number of women who reported various pregnancy outcomes (e.g., those who reported abortions, still births, infant deaths, full-term births, premature births, etc) was not provided.	Women's reports that "My health is not good."	Results of a number of poorly specified analyses appear to show that perceptions of an unsupportive partner, number of abortions and number of miscarriages were positively correlated with women's reports that "My present health is not good." Of these, perceptions of an unsupportive partner were most strongly related to self-reported health. The number of still births or infant deaths was not related to self-reported health.	Abortion history retrospectively self-reported. No information provided about response rate or representativeness of sample. Methods, measures, and analyses were particularly poorly specified, making it impossible to tell exactly what was measured. No reliabilities were reported for any measure. Single item dependent measure not valid indicator of health. No measures of pre-pregnancy mental health.



**Table 3B: Primary Data Comparison Group Studies**  
**NON-U.S. SAMPLES** (continued)

Citation	Sample & Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Teichman, Y., Shenhar, S., & Segal, S. (1993). Emotional distress in Israeli women before and after abortion. <i>American Journal of Orthopsychiatry</i> , 63, 277-288.	Israel. Seventy-seven women requesting legal abortion compared to pregnant women and nonpregnant women prior to their abortions. Only 17 women in abortion group agreed to participate at 3-month postabortion follow-up	Two comparison groups: 32 women who were in the 40th week of pregnancy and 45 nonpregnant women who belonged to the same community and were recruited through child care center or workplaces.	State and trait anxiety (STA); depression (Depression Adjective Check List).	Prior to the abortion, abortion group had higher anxiety and depression than comparison groups. No comparisons between groups on post-abortion measures.	No comparisons on post-abortion measures. Very small (N=17) postabortion sample. Initial sample response rate and representativeness unknown. Comparison groups do not control for unintended pregnancy. Different regulations for obtaining abortion in Israel make generalization to US inappropriate. In Israel, women must go before a committee to get approval for abortion. Anxiety and depression were assessed just prior to this (likely stressful) committee appearance. No measures of pre-pregnancy mental health.

Notes: AB = Abortion DEL = Delivery; Pg = pregnancy; ACOG = American College of Obstetricians and Gynecologists; ICD = International Classification of Diseases; Grp = Group; Sig = Significance

abortion in some of these countries differ in important ways from those of the United States. For example, in some countries where abortion is legal, such as Britain, all abortions must be approved by two physicians, usually on grounds that continuation of a pregnancy involves greater risk to the woman's physical or mental health than does termination (although such requirements may be more of a formality than a barrier).<sup>4</sup> Another example is Brazil, where induced abortion is illegal, except in cases where the pregnancy is dangerous to the mother's health or resulted from rape or incest. Caution must be exercised in drawing conclusions about the responses of women in the United States based on data collected on non-U.S. samples.

*Inappropriate comparison groups.* With two exceptions (Cohan et al., 1993; Gilchrist et al., 1995), none of these studies used a comparison group that controlled for the occurrence of an unintended or unwanted pregnancy, and hence was able to adequately address the question of relative risk. Comparison groups used

included women who reported never being pregnant (Felton, Parsons, Hassell, 1998), women who were currently pregnant (Bailey et al., 2001; Lydon et al., 1996; Medora et al., 1993; Teichman, Shenhar, & Segal, 1993), women who were not currently pregnant (Bradshaw & Slade, 2005; Teichman et al., 1993), women who reported no elective abortions (Conklin & O'Conner, 1995; Medora et al., 1993; Reardon & Ney, 2000; Williams, 2001), women who had miscarried (Bailey et al., 2001; Broen et al., 2004, 2005a, 2006), women who had participated in a previous public health survey (Lauzon, Roger-Achim, Achim, & Boyer 2000), and women matched on demographic variables (Barnett, Freudenburg, & Wille, 1992).

*Co-occurring risk factors.* Just as important as the lack of appropriate comparison groups in this set of studies was the absence of measures of mental health and other variables *prior to the pregnancy or abortion* likely to be related to the outcome studied (e.g., co-occurring risk factors such as prior engagement in

problem behaviors). Hence, any between-group differences observed post abortion may reflect between-group differences present prior to the pregnancy and/or abortion. With one exception (Gilchrist et al., 1995), none of the studies had adequate measures of preabortion mental health, and thus none could separate problems observed post abortion from those present pre-pregnancy. Furthermore, few of the studies controlled for important covariates, such as age, marital status, number of children, race, education, and duration of partnership that might be related to outcome variables independently of abortion history.

**Measurement problems.** In six of the papers, the key event—abortion—was determined from retrospective self-report, with no checks on accuracy of reporting, and no information on how long since the abortion occurred, whether the pregnancy was wanted or not, whether the abortion was first or second trimester, or what the age of the woman was at the time of the abortion (Conklin & O’Conner, 1995; Felton et al., 1998; Medora et al., 1993; Ney, Fung, Wickett, Beaman-Dodd, 1994; Reardon & Ney, 2000; Williams, 2001). As noted above, retrospective self-reports are notoriously unreliable and subject to bias, rendering conclusions of these six papers particularly untrustworthy. In studies where abortion was verified, mental health outcomes were often assessed within only a few weeks or months after the abortion. Only two studies assessed mental health outcomes more than a year post abortion (Broen et al., 2006; Gilchrist et al., 1995).

In several cases a single item of unknown reliability was used as a measure of mental health (Ney et al., 1994; Reardon & Ney, 2000). Only one study assessed clinically significant outcomes, that is, whether participants met diagnostic levels for psychological disorder or had sought psychiatric treatment (Gilchrist et al., 1995). The remainder focused on a variety of mental health-related outcomes, including self-esteem, positive and negative affect, decision satisfaction, life satisfaction, self-reported health-promoting behaviors, relationship quality, sexual attitudes and problems, grief, anxiety or depressive symptoms, and stress responses.

**Statistical problems.** Some of the studies report numerous analyses capitalizing on chance (e.g., Reardon & Ney, 2000), some used small sample sizes lacking suf-

ficient power to detect potentially meaningful differences (e.g., Cohan et al., 1993), some did not report sample sizes at all (Ney et al., 1994), and some reported no statistical tests of comparisons on postabortion measures but discussed results as if they had (e.g., Lauzon et al., 2000).

### ***Studies of Abortion for Reasons of Fetal Abnormality***

All of the studies reviewed above either were restricted to samples of women undergoing first-trimester abortions or did not differentiate first-trimester from later-trimester abortions. Although the vast majority of abortions in the United States are of unplanned pregnancies that are either mistimed or unwanted (Finer & Henshaw, 2006a), and they occur in the first trimester (Boonstra et al., 2006), the increasing accessibility and use of ultrasound technology and other prenatal screening techniques has increased the likelihood of prenatal diagnosis of fetal anomalies, often in the second and sometimes even in the third trimester. Following such a diagnosis, many couples elect to terminate their pregnancy, especially when informed that the fetal anomaly is lethal or severely disabling (see Statham, 2002, for a review of research in this area).

Abortion under these circumstances is a very different physical and psychological event than an abortion of an unplanned or unwanted pregnancy. Not only does abortion for reasons of fetal anomaly typically occur later in pregnancy, but more importantly, it usually occurs in the context of a pregnancy that was initially planned and wanted. Consequently, the meaning and significance of the pregnancy and abortion are apt to be quite different, as is the extent of loss experienced. Understanding women’s psychological experiences following an abortion for fetal anomaly is important. Some authors have speculated that women may feel more responsible for the death of their child when they make an active decision to terminate their pregnancy, leading to more negative long-term psychological sequelae compared with experiencing spontaneous miscarriage or perinatal loss (Salvesen, Oyen, Schmidt, Malt, & Eik-Nes, 1997). A full understanding of this issue requires comparing responses of women who undergo induced termination of a pregnancy due to fetal anomaly to responses of women who experience a miscarriage of a wanted pregnancy in the second or third trimester or experience a neonatal loss (e.g., a stillbirth or death of a



newborn) or deliver a child with severe physical or mental disabilities.

Our literature search identified six studies in which women who terminated an initially wanted pregnancy because of fetal anomaly were compared with another group of women. Five were based on non U.S. samples. These studies are summarized in Table 4. We also identified one U.S. study that examined psychological experiences among women who terminated an initially wanted pregnancy due to fetal anomaly, but the study did not include a contrast group. Findings of this study are summarized in Table 5.

**Description of findings.** Zeanah, Dailey, Rosenblatt, and Saller (1993) compared grief and depression scores of 23 women in the United States who underwent induced termination of a wanted pregnancy because of fetal anomalies to 23 demographically matched women who experienced spontaneous perinatal losses (stillbirth or death of a newborn infant). Controlling for age, there were no significant differences between the induced and spontaneous loss groups in grief, difficulty coping, despair or depression 2 months post abortion, or post spontaneous perinatal loss.

Lorenzen and Holzgreve (1995) compared grief reactions of 35 women in Germany who terminated a pregnancy due to fetal anomalies and 15 women who experienced a spontaneous second- or third-trimester miscarriage. Eight weeks post event, women who had terminated their pregnancy expressed significantly less grief than those who had a spontaneous child loss.

Iles and Gath (1993) compared psychiatric disturbance and grief among 71 women who underwent second-trimester abortion for reasons of fetal anomaly to 26 women who had a second-trimester spontaneous miscarriage. There were no significant differences in psychiatric disturbance (determined by interviews with a trained psychiatrist) between the termination and miscarriage groups or differences in grief between the two groups 4-6 weeks or 13 months post loss. Some signs of normal grief persisted for a full year in some women in both groups.

Kersting et al. (2005) compared stress responses of three groups of women in Germany—83 women who had had an induced late-trimester abortion for reasons

of fetal anomaly 2-7 years previously, 60 women who had a late-trimester abortion for fetal anomaly 14 days earlier, and 65 women who delivered a healthy child (time since delivery and abortion history unspecified). Women who delivered a healthy baby had lower stress scores (assessed with the Impact of Events scale-IES) than women who had a late-term abortion for fetal anomaly, regardless of whether the abortion occurred 14 days or 2-7 years previously. The two abortion groups did not differ in their grief responses. While 88% of the women in the abortion group believed they had made the right decision, 9.6% expressed doubts about their decision, and one woman felt she had made the wrong decision.

Salvesen et al. (1997) compared depression, general health, stress reactions, and anxiety of 24 women in Norway who terminated a pregnancy for fetal anomaly to 29 Norwegian women who experienced a perinatal death or late-trimester spontaneous miscarriage. Immediately after the event, both groups of women reported high intrusion scores on the IES, but the perinatal loss group reported significantly higher depressed affect and had higher scores on the intrusion and avoidance scales of the IES than did the induced termination group. At later assessments, including at 1 year post abortion, there were no significant differences between the two groups. One woman out of 36 exhibited symptoms of traumatic stress; she was in the perinatal loss group.

Rona, Smeeton, Beech, Barnett, and Sharland (1998) compared depression and anxiety (assessed with the Hospital Anxiety and Depression (HAD) scale) of three groups of women in the United Kingdom. One group consisted of 28 women who received a confirmed diagnosis during their second trimester of a severe fetal heart malformation and terminated the pregnancy. A second group consisted of 40 women in whom a fetal heart malformation was initially diagnosed but later disconfirmed by a specialist. A third group consisted of 40 women whose fetal malformation was not identified and who had given birth to an infant with a severe heart malformation. The HAD scale was administered 6-10 months after the heart malformation was initially diagnosed or post delivery in the latter group. Based on cutoff scores on the HAD ( $> 11$ ), a significantly greater proportion of mothers who had an infant with a severe heart malformation reported clinical levels of



**Table 4: Abortion for Reasons of Fetal Anomaly**

Citation	Sample and Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Iles, S. & Gath, D. (1993). Psychiatric outcome of termination of pregnancy for foetal abnormality. <i>Psychological Medicine</i> , 23, 407-413.	United Kingdom. Women with second trimester abortion for fetal abnormality (AB group) recruited from hospitals (ave. age 30.7 years). 77% of pregnancies planned. 86% participation rate. Interviewed by psychiatrist three times: 4-6 weeks post- (T1, N=71), 6 months post- (T2, N=65), and 13 months post- (T3, N=61) termination.	Twenty-six women with second trimester miscarriage (MIS group; ave age 30.3 years) interviewed at same three time points (84% participation rate) 77% of pregnancies planned. Also compared AB and MIS groups to diagnostic norms for non-puerperal women and 12 month post-partum women	Intensity of psychiatric disturbance (PSE Index of Definition (ID)), established via interviews with trained psychiatrist at three time points. ID levels of 5 or above indicate a psychiatric "case." Grief also assessed via interview.	No significant differences between AB and MIS groups in psychiatric disturbance at T1, T2, or T3. At T1 both groups showed considerable psychiatric morbidity and impairment of social adjustment relative to the norming samples of the instruments. By T2 and T3, psychiatric morbidity was near norms in both groups. No differences in grief between the AB and MIS groups at T1 and T4. Some signs of normal grief persisted for a full year in some women in both groups.	Small sample sizes. Sample representativeness unknown. Abortion for fetal abnormality not typical of most abortions. No measures of prepregnancy mental health.

anxiety (43%) and depression (18%) compared to women in the other two groups. Among those who had terminated their pregnancy, 32% were categorized as anxious, and 4% as clinically depressed. Among mothers whose initial diagnosis of fetal abnormality was later disconfirmed, the comparable percentages were 15% (anxiety) and 5% (depression). Women who had terminated their pregnancy were more anxious than this latter group of women who had delivered healthy infants. The authors attributed the higher anxiety in the termination group than the latter group to either the experience of therapeutic abortion or to a fear of a subsequent abnormal pregnancy. Younger age was associated with higher anxiety.

**Evaluation of fetal abnormality studies.** All of the above studies are limited by high attrition rates, typically low response rates, and extremely small sample sizes. The small sample sizes restrict power, and, hence, the ability of these studies to detect significant differences between groups. In most studies, the sample also

was of unknown representativeness. Despite these methodological limitations, these studies tell a fairly consistent story. Women's levels of negative psychological experiences subsequent to a second-trimester abortion of a wanted pregnancy for fetal anomalies were higher than those of women who delivered a healthy child (Kersting et al., 2005; Rona et al., 1998) and comparable to that of women who experienced a second-trimester miscarriage (Iles & Gath, 1993), stillbirth, or death of a newborn (Salveson et al., 1997; Zeanah et al., 1993). There was no evidence, however, that induced termination was associated with greater distress than spontaneous miscarriage or perinatal loss. Indeed, the one difference observed was that women who terminated a pregnancy because of fetal anomaly experienced significantly less grief than women who miscarried 8 weeks post loss (Lorenzen & Holzgreve, 1995). Nonetheless, grief among both groups was high and appears to persist for some time. The one study that compared the mental health of women who terminated a pregnancy for fetal abnormality and women who delivered an infant with a severe abnormality



**Table 4: Abortion for Reasons of Fetal Anomaly (continued)**

Citation	Sample and Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Kersting, A., Dorsch, M., Kreulich, C., Reutemann, M., Ohrmann, P., Baez, E., & Arolt, V. (2005). Trauma and grief 2-7 years after termination of pregnancy because of fetal anomalies—a pilot study. <i>Journal of Psychosomatic Obstetrics &amp; Gynecology</i> , 26, 9-14.	Germany. Recruited at Dept of Gyn & Obstetrics. Women who had late trimester abortions (15-33 weeks gestation) for fetal abnormality. 83 responded to mailed questionnaire 4 years post abortion (ave. age 31 years). 49% response rate. 60 women completed questionnaires 14 days post abortion (ave. age 34 years). Response rate not provided.	Sixty-five women who had delivered a healthy child (time since delivery not specified) (average age 32 years)	Stress reactions (avoidance, intrusion, hyperarousal, assessed with Impact of Events scale), Grief (Perinatal Grief scale) and Decision satisfaction (termination groups only).	Women who had a late-term abortion for fetal abnormality scored higher than those who delivered a healthy baby on the IES (both overall, and on all three subscales), regardless of whether they had terminated their pregnancy 14 days earlier or 2-7 years earlier. The two abortion groups did not differ in grief responses, except that the women who had the abortion more recently scored higher on fear of loss. 87.9% of abortion group believed (very strongly to fairly strongly) that they had made the right decision; 9.6% expressed doubts about their decision, and one woman felt she had made the wrong decision.	Sample representativeness unknown. Low response rate, or response rate unknown. Comparison group (delivery of healthy child) not appropriate. Abortion for fetal abnormality not typical of most abortions. No measures of pre-pregnancy mental health.
Lorenzen & Holzgreve (1995). Helping parents to grieve after second trimester termination of pregnancy for fetopathic reasons. <i>Fetal Diagnostic Therapy</i> , 10, 147-156.	Germany. Compared grief reactions of 35 women who terminated a pregnancy for fetal abnormality (65% response rate) to 15 women after the spontaneous loss of a child between the 12th and 24th week of gestation (60% response rate). At the time of the termination or miscarriage, all women had been encouraged by hospital personnel to make the lost baby a tangible person.	Fifteen women experiencing the spontaneous loss of a child between the 12th and 24th week of gestation (60% response rate). There were no sig diff between the two groups in age, marital status, or previous child losses.	Both groups completed the Perinatal Grief scale in response to a mailed questionnaire an average of 8 weeks after the loss of the child.	Women who experienced a spontaneous child loss expressed significantly more grief than those having undergone termination 8 weeks post child loss. The majority of women who terminated due to fetal abnormality were convinced of the rightness of their decision and said they would again vote for termination in a similar situation.	Very small sample sizes of unknown representativeness. Short follow-up interval.



**Table 4: Abortion for Reasons of Fetal Anomaly (continued)**

Citation	Sample and Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Rona, R. J., Smeeton, N. C., Beech, R., Barnett, A., & Sharland, G. (1998). Anxiety and depression in mothers related to severe malformation of the heart of the child and fetus. <i>Acta Paediatrica</i> , 87, 201-205.	United Kingdom. Compared depression and anxiety 6-10 months post termination of three groups of women. Group A consisted of 28 women who terminated a pregnancy during the second trimester due to severe fetal heart malformation 6-10 months posttermination.	40 women referred to fetal cardiology in whom a fetal heart malformation was suspected but later disconfirmed (Group B), and 40 women whose fetal heart malformation was not diagnosed during pregnancy, and who gave birth to a child with a severe heart malformation (Group C).	Anxiety and depression assessed with the Hospital Anxiety and Depression (HAD) scale. A score of 11 or more indicates probable presence of clinical anxiety or depression. HAD scale administered by mailed questionnaire 6-10 months after initial diagnosis of a heart malformation or 6-10 months post delivery of a child with severe heart malformation. 67.5% response rate.	Greater percent of mothers of infants with severe heart malformation (Group C) had clinical levels of anxiety (43%) and depression (18%) compared to women in Group A who had terminated for fetal anomaly (anxious = 32%; depressed = 4%) or Group B whose initial diagnosis was later disconfirmed (anxious = 15%; depressed = 5%). Women in Groups A and C were significantly more anxious than women in Group B. Younger age was associated with higher anxiety. Authors attributed high anxiety in Group A to either the experience of therapeutic abortion or to fear of a subsequent abnormal pregnancy.	Small sample sizes. Sample representativeness unknown. Abortion for fetal abnormality not typical of most abortions. No measures of pre-pregnancy mental health.

found that 6-10 months post event, a greater proportion of women in the delivery group reported clinically significant anxiety and depression compared to women in the abortion group.

## REVIEW OF ABORTION-ONLY STUDIES

In addition to the primary research reviewed above, our literature search also identified a set of papers that met all inclusion criteria except that they did not include a comparison group. Studies without a comparison group are not appropriate for addressing questions of relative risk. However, studies focused solely on reactions and feelings of women who have

had an abortion can be useful for identifying factors that predict individual variation in women's psychological experiences following abortion. Furthermore, they can potentially address questions related to the prevalence of harm associated with abortion to the extent that their sample is representative of the population to which one wants to generalize. Because differences between the United States and other countries in cultural contexts surrounding abortion and abortion regulations make generalization from non-U.S. samples to U.S. women problematic, the TFMHA reviewed only those noncomparison group studies that met inclusion criteria that were based on U.S. samples.

The TFMHA identified 23 published papers that were based solely on samples of women who had abortions in the United States, but that otherwise



**Table 4: Abortion for Reasons of Fetal Anomaly (continued)**

Citation	Sample and Design	Comparison Group	Primary Outcome	Key Findings	Limitations
Salveson, K.A., Oyen, L., Schmidt, N., Malt, U.F., & Eik-Nes, S.H. (1997). Comparison of long-term psychological responses of women after pregnancy termination due to fetal anomalies and after perinatal loss. <i>Ultrasound Obstetrics &amp; Gynecology</i> , 9, 80-85.	Norway. Compared depression, general health, stress reactions, and anxiety of 24 women who terminated a pregnancy for fetal anomaly (< 24 wks gestation) to 29 women who experienced perinatal loss (82% response rate). Interviewed day of or several days after event and sent mailed questionnaires 7 weeks, 5 months, and 1 year post event.	Twenty-nine women experiencing late spontaneous miscarriage (16-27 wks pregnancy) or perinatal death (death of a live born child within 7 days after birth or still birth after 28 wks pregnancy). Abortion and perinatal loss groups similar in parity, age, education, % nulliparous and psych health in 2 weeks preceding event (assessed retrospectively with GHQ).	Depression (Montgomery & Ashberg Depression Rating scale), anxiety (State-Trait Anxiety Inventory), and stress responses (Impact of Events scale-IES-avoidance and intrusion subscales). Goldberg General Health Questionnaire (GHQ) used to retrospectively assess women's psychological health in the 2 wks preceding event. Schedule for Recent Life Events used to control for other life events that might influence grief response. Time 1 measures given by interviewer; remaining measures sent by mailed questionnaire. Made diagnosis of post-traumatic stress disorder based on multiple criteria.	Immediately post-event, both groups reported high intrusion scores on IES, but abortion group showed less depression, and had lower scores on intrusion and avoidance scales of IES than perinatal loss group. There were no significant differences between AB and perinatal loss groups on IES intrusion or avoidance scores, anxiety, general health (GHQ), or depression at subsequent assessments (7 wks, 5 months, or 1 year post event). At 1 year postevent one woman (1/36 or 3%) met criteria for PTSD. She was in perinatal loss group.	Strong aspects of study include use of psychometrically valid measures and comparability of AB and comparison groups. Major limitation is extremely small sample sizes.
Zeanah, C.H., Dailey, J., Rosenblatt, M., & Saller, D.N. (1993). Do women grieve after terminating pregnancies because of fetal anomalies? A controlled investigation. <i>Obstetrics and Gynecology</i> , 82, 270-275.	U.S. 23 of 36 women who underwent induced termination of wanted pregnancies for fetal anomalies (ave age 31.4 years) interviewed 2 months post termination. (64% response rate).	23 women matched demographically (social class, education, number of children, age, gestational age at loss) who experienced spontaneous perinatal loss (stillbirth or death of newborn infant) interviewed 2 months post loss. Comparison group was significantly younger (ave age 27.2 years) than termination group, and gestational age was greater. Age was inversely related to grief.	Grief, difficulty coping, and despair (Perinatal Grief Inventory). Depression (Beck Depression Inventory). Clinical diagnosis by psychiatric evaluation (termination group only).	Controlling for age, there were no significant differences between the termination and spontaneous perinatal loss groups in grief, difficulty coping, despair, or depression. Psychiatric evaluation of termination group 2 months post revealed that 74% reported they were still grieving, 17% met criteria for major depression, and 23% had sought psychiatric help. Only 1 regretted her decision.	Extremely small sample sizes. Short follow-up interval. No comparisons of termination and spontaneous loss group on psychiatric evaluation. Thirty-six percent nonparticipation rate in termination group. No measures of pre-pregnancy mental health.

Notes: AB = Abortion; DEL = Delivery; Pg = pregnancy; ACOG = American College of Obstetricians and Gynecologists; ICD = International Classification of Diseases; Grp = Group; Sig = Significance



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison**

**Prospective Analyses Using Major et al. Multiple Site Sample**

**General Description:** Women followed for 2 years after an elective first-trimester abortion for an unintended pregnancy, recruited from 3 sites in Buffalo, NY in 1993. Four assessments: 1 hour before abortion, and 1 hour, 1 month, and 2 years after the abortion; 85% (N = 882) of eligible women agreed to participate, completing preabortion and 1 hour postabortion questionnaires; follow-up questionnaires were completed 1 month (N = 615) and 2 years (N = 442) post abortion. The age range was 14-60; 65% were White/other.

**Limitations Common to All Studies Based on this Data Set:** Common to All Studies Based on this Data Set: No comparison group (not a limitation for majority of studies which examined risk factors, mediators, and moderators of post-abortion psychological distress). Sample may not be representative of women who obtain abortions in the U.S., although only sociodemographic difference from national comparison sample was underrepresentation of Hispanic women. High attrition: 30% at 1 month and 50% at 2-year follow-up, but women retained did not differ from women lost to follow-up at either time point on demographic or psychological measures. Does not include measures such as domestic violence and sexual abuse that may be related to post-abortion adjustment.

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Major, B., Cozzarelli, C., Cooper M. L., et al. (2000). Psychological responses of women after first-trimester abortion. <i>Archives of General Psychiatry</i> , 557, 777-784.	Sample consisted of the total 442 Women followed for 2 years after abortion. This is the only study whose analysis used data from all 4 time points.	In one simultaneous regression analysis, demographic characteristics, prior mental health and self reports of physical complications were controlled. (Note: controls not required for most analyses.)	Measures include Brief Symptom Inventory, modified Diagnostic Interview Schedule, 4-item Rosenberg Self-Esteem Inventory, adapted PTSD scale, emotional reactions, satisfaction with decision, appraisal of abortion-related harm.	Most women were satisfied with their decision (78.7% at 1 month) although decision satisfaction decreased over time (72% satisfied at 2 years). Most women felt more benefit than harm from abortion decision and this did not change over time. Negative emotions increased, and positive emotions decreased over time but most women felt more relief than either positive or negative emotions. Depression lower and self-esteem higher 2 years post-abortion than pre-abortion. Depression rate was similar to rates in the general population for women in this age group.	Harm and regret are non-standardized measures, and difficult to interpret with no comparison group. Cannot use findings to examine prevalence of psychiatric outcomes associated with abortion nationally.

met inclusion criteria. These studies are summarized in Table 5. The studies were of two major types: (1) prospective or concurrent studies that usually included preabortion measures of psychological adjustment and risk factors and one or more postabortion assessments of adjustment, and (2) retrospective studies that assessed women's perceived reactions to the event and current level of psychological func-

tioning several years after the abortion. The former provide a wealth of information on predictors of postabortion psychological functioning. The retrospective studies—although supporting many of the conclusions of research prior to 1990—have serious methodological problems that negate their ability to answer questions about psychological experiences following abortion.



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison**  
(continued)

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Major B., & Gramzow, R. (1999). Abortion as stigma: cognitive and emotional implications of concealment. <i>Journal of Personality and Social Psychology</i> , 77, 735-745.	442 Women followed for 2 years after an elective first trimester abortion.	Positive and negative affectivity, personal conflict over abortion, demographic variables of age, race, number of prior live births, Medicaid status.	Pre-abortion and 2 year post abortion distress measured by the Brief Symptom inventory.	Average levels of psychological distress 2 years post abortion were low, and lower than average pre-abortion distress. 2 years post abortion, 47% of women agreed or strongly agreed that they felt they would be stigmatized if others knew about the abortion. 44.9% felt need to keep abortion a secret. Concealing stigma was associated with more residualized distress, via increased thought suppression and decreased emotional disclosure.	
Cozzarelli, C., Major, B., Karrasch, A., & Fuegen, K. (2000). Women's experiences of and reactions to anti-abortion picketing. <i>Basic and Applied Social Psychology</i> , 25, 265-275.	442 women followed for 2 years after an elective first trimester abortion.	Correlations between model variables and demographic variables and negative affectivity (NA) were examined. Only age and NA were related to more than one of model variables. When model was rerun with control variables added, results were similar.	Depression assessed using the 7-item depression subscale of the Brief Symptom Inventory about one hour post abortion in the delivery room and 2 years postabortion at follow-up.	Feeling guilty in response to seeing picketers and having high personal conflict about abortion predicted immediate postabortion depression, whereas feeling angry was unrelated to postabortion depression. Although guilt and personal conflict had no direct effects on depression 2-year post abortion, depression at the two time points was correlated. The authors conclude that women's encounters with picketers evoke short-term negative emotional reactions but do not have long-term negative psychological effects.	Non-standardized measure of emotional reactions to picketing; no objective (coders) reports of picketing activity. Single measure of postabortion adjustment. No pre-abortion measure of depression.



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison**  
(continued)

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Quinton W. J., Major B., & Richards C. (2001). Adolescents and adjustment to abortion: Are minors at greater risk? <i>Psychology, Public Policy and Law</i> , 7, 491-514.	38 minors and 402 adults followed for 2 years after an elective first trimester abortion.	None.	Post-abortion adjustment (depression, decision satisfaction, benefit-harm appraisals, abortion-specific emotions, would make the same decision), at 1 month and 2 years; risk factors assessed on day of abortion.	No significant difference between adults and minors at 2 years post abortion; at 1 month, adolescents slightly less satisfied and have less perceived benefit.	Small sample of women under age 18.
Major, B., Richards, C., Cooper, L. M., & Zubek, J. (1998). Personal resilience, cognitive appraisals and coping: An integrative model of adjustment to abortion. <i>Journal of Personality and Social Psychology</i> , 74, 735-752.	527 women; all women (N = 615) completed preabortion and approximately 1-month postabortion questionnaires; analysis is limited to 527 women who provided complete data on all relevant study variables.	All models tested controlling for measures of prior adjustment. Neuroticism, age, education, religion, race, and whether it was the woman's first abortion.	Post-abortion adjustment measured by the Coping Operation Preference Enquiry, residualized distress (the depression, hostility, and anxiety subscales of the Brief Symptom Inventory), the Positive Well-Being scale and decision satisfaction.	Preabortion personal resources (items taken from existing measures of self-esteem, dispositional optimism and personal control) related to postabortion adjustment through preabortion cognitive appraisals and post-abortion coping. Cognitive appraisals' effects on adjustment mediated by postabortion coping. Women who had more personal resources perceived their abortions as less stressful and had better coping skills.	Non-standardized measures of personal resources, cognitive appraisals, and decision satisfaction.
Cozzarelli, C., Sumer, N., & Major, B. (1998). Mental models of attachment and coping with abortion. <i>Journal of Personality and Social Psychology</i> , 74, 453-467.	615 women who completed a preabortion, immediate postabortion and approximately 1 month follow-up questionnaire.	Age, marital status, whether or not this was a first abortion.	Psychological distress (42 items from the SCL-90) and psychological well-being (18 item index developed by Ryff).	Mental models of attachment were related to postabortion functioning. This relationship was mediated by perceived social support, perceived social conflict, and self-efficacy. Models of self was a stronger predictor of adjustment than model of others.	All measures of social support based on women's self-reports. Limited indirect global measure of mental models of attachment. Missing data on mental models with sociodemographic differences between missing and non-missing data groups.



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison**  
(continued)

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Major, B., Zubek, J. M., Cooper, M. L., Cozzarelli, C., & Richards, C. (1997). Mixed messages: Implications of social conflict and social support within close relationships for adjustment to a stressful life event. <i>Journal of Personality and Social Psychology</i> , 72,1349-1363.	615 women who completed preabortion and 1-month follow-up questionnaires.	Positive and negative reactivity; lifetime history of depression (from DIS), seeking professional mental health counseling, demographic variables related to one or more criterion measures (includes age, race, education, marital status, religion, whether this is first abortion).	Separate measures of distress and well-being at 1-month follow-up. Psychological distress assessed using the SCL-90 subscales of depression, anxiety, hostility and somatization. Positive well-being was measured using the 18-item short version of the Ryff Positive Well-Being scale.	Perceived abortion-specific social support and social conflict (measured preabortion) were related to 1-month postabortion adjustment after potential confounds were controlled. Perceived social conflict from partner predicted distress but not well-being; social support from partner predicted well-being but not distress. Perceived support from mother or friend was associated with well-being. Social conflict with mother or friends interacted with social support to predict distress. Women who perceived high support from these sources were more distressed if they also perceived high conflict.	All measures of social support and social conflict based on women's self-reports.

### Prospective Studies

The majority of prospective studies were conducted by one group of investigators, Major and colleagues. Seven papers published since 1990 were based on data from a multisite sample of first-trimester abortion patients in the Buffalo, NY, area (Sample 1). These papers are not independent of each other because they are based on the same sample. Four additional papers were based on three separate samples of women from the same geographic area obtaining first-trimester abortions (Samples 2, 3, and 4). Four of the seven Sample 1 studies analyzed data of 442 women followed for 2 years after a first-trimester abortion for an unintended pregnancy at one of three sites. Assessments took place at four time points: preabortion and 1-hour, 1-month, and 2-years post abortion. The three other papers based on Sample 1 did not include the 2-year follow-up in their

analyses. The other studies by Major and colleagues were based on smaller samples of 291 (Sample 2), 283 (Sample 3), and 247 (Sample 4) women recruited from a single abortion facility who provided preabortion and 30-minute- and 1-month postabortion follow-up data.

Although the lack of comparison groups of women with an unintended pregnancy who carry to term is a significant limitation for assessing relative risk of abortion versus alternatives, as a group, the Sample 1 studies have a number of methodological strengths, including use of standardized measures of psychological experiences, appropriate data collection and analysis procedures, a large sample, reasonably long postabortion follow-up, analyses of changes in abortion reactions over time, and sound social-psychological theory to direct analyses. One potential limitation



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison** (continued)

**Prospective Analysis Using Major & Colleagues 1-Site Sample**

**General Description:** 291 English-speaking women who obtained a first trimester abortion at a private free-standing clinic in Buffalo, NY. Women completed a preabortion, immediate postabortion and 3-week follow-up questionnaire. From a larger sample of 336 women, but 45 eliminated from analysis because they did not complete the immediate post-questionnaire. Average age was 23.3 (range = 14-40); 66% White, 74% single.

**Limitations Common to All Studies Based on this Data Set:** No comparison group (not a limitation for majority of analyses which examined risk factors, mediators and moderators of postabortion psychological distress). Sample is limited to women from one clinic and is not nationally or regionally representative of women who obtain abortions. Short follow-up period; high attrition rate: 38% completed the 3-week follow-up questionnaire. Differences in sociodemographic characteristics of those who completed 3-week follow-up and those lost to follow-up. Does not include measures such as domestic violence and sexual abuse that may be related to postabortion adjustment.

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Cozzarelli, C., & Major, B. (1994). The effects of anti-abortion demonstrators and pro-choice escorts on women's psychological responses to abortion. <i>Journal of Social and Clinical Psychology</i> , 13, 404-427.	291 women who received first trimester abortions.	None.	Outcome immediately post abortion and at 3-week follow-up was measured by the SCL-90 Depression subscale.	Prior to the abortion women were asked about their perceptions of anti-abortion demonstrator and pro-choice escort activity. Pro-choice escorts buffered the effects of anti-abortion demonstrators but not the intensity of their picketing on women's psychological adjustment. The more women felt upset by the demonstrators and the more intense the anti-abortion activity, the more depression they experienced immediately postabortion.	Correlations are modest, although authors state that % of variance explained is more than for social support or for religious/attitudinal conflict in this data set.
Cozzarelli, C. (1993). Personality and self-efficacy as predictors of coping with abortion. <i>Journal of Personality and Social Psychology</i> , 65, 1224-1236.	291 English-speaking women who obtained a first trimester abortion.	Preabortion depression	SCL-90 Depression subscale and 9-item scale assessing current affective state were combined to create a postabortion distress index.	Self-efficacy regarding post-abortion coping was the strongest predictor of psychological adjustment immediately after and 3-weeks post-abortion. Self-efficacy mediated the effects of self-esteem, optimism, and perceived control on adjustment at both time points. Initial depression strongly predicted both self-efficacy and adjustment.	



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison (continued)**

**Other Prospective Studies**

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Major, B., Cozzarelli, C., Sciacchitano, A. M., Cooper, M. L., Testa, M., & Mueller, P. M. (1990). Perceived social support, self-efficacy and adjustment to abortion. <i>Journal of Personality and Social Psychology</i> , 59, 452-463.	283 women obtaining a first trimester abortion at an abortion clinic in Buffalo, NY, in 1987 (91% participation rate). Ave. age = 22, 78% white, 80% single (see also Mueller & Major, 1989). Perceived social support and self-efficacy for coping with abortion assessed prior to the abortion. Adjustment assessed 30 min post abortion.	Demographic variables related to criterion variables, included marital status, religion (Catholic, non-Catholic), and race (White, other).	1. For the primary path analyses 3 psychological outcome measures (mood, anticipation of negative consequences and depression as measured by the short form of the BDI) given 30 minutes postabortion were standardized and summed to create a single adjustment measure. 2. For assessing the effects of nondisclosure and disclosure on adjustment, four separate outcome variables were depression, mood, anticipated negative consequences, and physical complaints.	High perceived social support predicted increased preabortion self-efficacy for coping with abortion and better postabortion adjustment. Self-efficacy mediated the positive effects of perceived social support on adjustment. Also, women who told close others of their abortion and felt these others were not completely supportive had lower postabortion adjustment than those who did not tell others or those who told and felt completely supported. 85% told partner; 66% told friends; 40% told family of their abortion.	Extremely short postabortion interval; no additional follow-up. Nonstandardized measures of coping self-efficacy and social support. No preabortion assessment of psychological outcomes (coders) reports of picketing activity. Single measure of postabortion adjustment. No pre-abortion measure of depression.
Major, B., Cozzarelli, C., Testa, M., & Mueller, P. (1992). Male partners' appraisals of undesired pregnancy and abortion: Implications for women's adjustment to abortion. <i>Journal of Applied Social Psychology</i> , 22, 599-614.	73 couples in which woman received a first trimester abortion and male partner accompanied her to the clinic. (Women's ave age = 20, 79% never married, 93% White). They were part of a larger sample of 247 women obtaining abortions at a clinic in Buffalo NY in 1983; 88% of those who were accompanied by their partner participated in this study. Original sample (88% White, 78% single) had 92% participation rate (see Major, Mueller & Hildebrandt (1985.)	Women's coping expectancies for analyses of impact of men's appraisal on partner's adjustment.	Women's adjustment measured 30 minutes post abortion using short form of BDI.	Coping expectancies and attributions assessed immediately pre-abortion. Men's coping expectancies regarding this abortion influenced their female partners' depression levels only for women with low coping expectancies. Women with low coping expectancies whose partners also had low coping expectancies were the most depressed. Men's attributions about the pregnancy were unrelated to their partners' adjustment.	Sample unrepresentative of larger sample of women obtaining abortions at this particular clinic; most of whom went to the clinic without a partner. Relatively small sample size. Extremely short postabortion interval; no additional follow-up. 1-item measure of coping expectations; no pre-abortion assessment of depression.



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison (continued)**

**Other Prospective Studies**

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Pope, L. M., Adler, N. E., & Tschann J. M. (2001). Postabortion psychological adjustment: Are minors at increased risk? <i>Journal of Adolescent Health</i> , 29, 2-11.	96 women (23 under 18, 40 aged 18-21) seeking pregnancy termination at 6-12 weeks gestation in four clinics in San Francisco, CA; 63 completed follow-up. English speakers only, 1/3 were African American.	Did not control for demographic variables because none were related to postabortion adjustment.	Follow-up 4 weeks post abortion, with assessment of Beck Depression Inventory, "emotion" scale, Spielberger State Anxiety Inventory, Rosenberg self-esteem scale, Impact of Events scale, Positive States of Mind scale.	No difference between under 18 and over 18 group, except younger group scored slightly lower on "comfortable with decision"; for combined age groups pre-abortion emotional state and perceived partner pressure predicted postabortion adjustment.	Small sample size. Limited representativeness of sample; urban population in state without parental requirement for abortion, 6-12 weeks gestation only. Attrition: 34% lost to follow-up; differences between those retained and lost to follow-up, (e.g., on religion and depression). Functional relevance not well-established for all of the measures used.
Burgoine, G. A., Van Kirk, S. D., Romm, J., Edelman, A. B., Jacobson, S., & Jensen, J. T. (2005). Comparison of perinatal grief after dilation and evacuation or labor induction in second trimester terminations for fetal anomalies. <i>American Journal of Obstetrics and Gynecology</i> , 192, 1928-1932.	49 women who terminated a desired second trimester pregnancy because of a fetal abnormality through either dilation and evacuation (D&E) or induction of labor (IOL).	None.	Depression was measured with the Edinburgh Postnatal Depression scale at enrollment, 4 month and 12 month follow-up and grief, using the Perinatal Grief scale at 4-month and 12-month follow-up.	Cutoff scores were set for clinical depression and grief. No significant differences were found between the surgical (D&E) and medical (IOL) groups in levels of grief or depression at any time point.	Small sample; very limited statistical power. High attrition: 57% completed 4-month and 58% completed 12-month follow-up; only 28.5% completed both (use of mail back questionnaires at 4 and 12 months). No random assignment to group.
Phelps, R. H., Schaff, E. A., & Fielding, S. L. (2001). Mifepristone abortion in minors. <i>Contraception</i> , 64, 339-343.	35 adolescents 14-17 years of age in Rochester, NY, who had mifepristone abortions at <56 days gestation.	None.	Rating scales assessed emotional response variables on questionnaires at Day 1 (first visit when mifepristone was administered) and immediately post abortion (Days 4-8) and telephone interview 4 weeks post abortion.	Little emotional improvement from first visit to immediate post abortion. Greater emotional improvement reported from postabortion to four week follow-up, e.g., stress (57% to 21%) and feeling scared (43% to 8%) decreased significantly from first visit to 4 week follow-up.	Small sample. Limited generalizability. Study limited to teens with parental consent to participate but parental consent not required in NY for an abortion. No comparison groups such as surgical abortion clients or adult women. Non-standardized single time measures of emotional responses. Some adolescents still had incomplete abortions when they completed the immediate postabortion questionnaire.



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison** (continued)

**Other Prospective Studies**

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Miller, W. B. (1992). An empirical study of the psychological antecedents and consequences of induced abortion. <i>Journal of Social Issues</i> , 43, 67-93.	64 women who had induced abortions who were part of a larger prospective longitudinal study of 987 never married, recently married women, or recent first-time mothers who delivered living in the San Francisco Bay area in the 1970s. The women were interviewed 4 times at yearly intervals.	None.	Postabortion "regret" assessed by a one-item question that asked if the woman would choose to have an abortion again. Emotional upset assessed at final interview by a one-item measure that asked if the woman had experienced emotional upset from the abortion after first few weeks.	Women with a Protestant religious background had less regret and those with a traditional gender role orientation reported more regret. Emotional upset after first few weeks of abortion associated with not being married at time of the abortion and being low in traditional gender-role orientation.	Single-item measures of the negative psychological reactions to abortion. Retrospective reporting of the emotional impact of the abortion. Lack of specification of abortion history. Probable under-reporting of abortions. Sample limited to White English speaking women. Only small subset of representative sample (64 of 987) are in the abortion group.
Sit, D., Rothchild, A. J., Creinin, M. D., Hanusa, B. H., & Wisner, K. L. (2007). Psychiatric outcomes following medical and surgical abortion. <i>Human Reproduction</i> , 22, 878-884.	47 women who obtained surgical abortions and 31 women who obtained non-surgical abortions in Pittsburgh and Western Pennsylvania at < 9 weeks gestation.	Age and race initially included. No differences between groups in other demographic characteristics, past reproductive history, or psychiatric history.	Depression assessed immediately pre-abortion and approximately one-month (range = 14-60 days) post abortion using the Edinburgh Postnatal Depression Scale.	No differences in depression between groups. Both groups experienced a significant decline in depression from pre- to post abortion (35-36% at increased risk pre-abortion vs. 17-21% at risk post abortion defined as EPDS > 10). Women with a past history of psychiatric problems at a higher risk of post abortion depression.	Small sample; limited measures of pre-abortion characteristics; lack of differences between in participant characteristics between groups may be due to small sample size and limited power.

is the high attrition rate; the 442 women for whom data were available 2 years post abortion represent 50% of the original sample. However, the researchers conducted detailed analyses to show that women who completed the follow-up and those lost to follow-up not did not significantly differ on any demographic or psychological characteristic. A second limitation is the lack of measures of mental health prior to the pregnancy. Strengths and limitations of Samples 2, 3, and 4 are similar to those of Sample 1 with the added caveat that these were smaller samples from a single site followed for a shorter time period.

Analyses based on the Sample 1 data set examined changes over time in women's psychological experiences. Most women reported that they had benefited from their abortion more than they had been harmed by it, and these appraisals did not change from 1 month to 2 years post abortion (Major et al., 2000). Most women also reported that they were satisfied with their decision, although the percentage satisfied decreased from 1 month (79%) to 2 years (72%). Women also reported feeling more relief than positive or negative emotions both immediately and 2 years after their abortion. Over the 2 years, however, relief



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison** (continued)

**Retrospective Studies** (all these studies lacked a preabortion measure of psychological functioning)

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Coleman, P.K., & Nelson, E.I. (1998). The quality of abortion decisions and college students' reports of post-abortion emotional sequelae and abortion attitudes. <i>Journal of Social and Clinical Psychology</i> , 17, 425-442.	31 female and 32 male college students at a mid-sized southeastern university who reported a previous abortion; a subsample of a larger study of abortion attitudes.	Time since the abortion.	Single-item nonstandardized measures of postabortion depression and depression and anxiety.	Dimensions of abortion decisions (ambivalence, regret, comfort) and emotional connection to the fetus were not associated with self-reported anxiety and depression for women with the exception that comfort was related to anxiety.	Small sample; abortion history retrospectively self-reported. Single-item non-standardized outcome measures. Unwarranted conclusions, e.g., state that "more than one-half of the women and over one-quarter of the men experience post-abortion increase in depression" based on responses to an item stating, "I have experienced some depression since the time of my abortion."
Franz, W., & Reardon, D. (1992). Differential impact of abortion on adolescents and adults. <i>Adolescence</i> , 105, 161-172.	252 women aged 16-64 who have had an abortion were divided into adolescent vs. adult groups based on age at time of abortion (114 younger than 20 and 138, 20 or older). Respondents recruited by sending survey forms to all identified Women Exploited by Abortion groups in the U.S.	None.	Apparently single-item assessed self-report of "severe psychological reactions" to the abortion. Item/scale not adequately described.	Adolescent participants reported significantly greater severity of psychological stress than adult participants and were more likely to feel forced to have the abortion and misinformed at the time of abortion. Predictors of severe psychological stress were feeling forced to abort, being dissatisfied with abortion services and having a very negative view of abortion.	Unrepresentative convenience sample of women already in a support group. Abortion history retrospectively self-reported. Time since abortion varied greatly (1-15 years). Differences between groups in sociodemographic characteristics and pregnancy history are unknown and not controlled. No information on ethnicity of (total) sample. Less than half of surveys mailed to groups (47%) were returned.

and positive emotions declined, whereas negative emotions increased. Depression scores were lower, and self-esteem was higher 2 years after the abortion compared with just prior to the abortion.

Collectively, these findings add to knowledge of predictors and mediators of psychological outcomes over a longer follow-up period than earlier abortion-only

studies. These studies showed that women at higher risk for negative emotions 2 years post abortion included those with a prior history of mental health problems (Major et al., 2000), younger age at the time of the abortion (Major et al., 2000), low perceived or anticipated social support for their decision (Cozzarelli, Sumer, & Major, 1998; Major, Zubeck, Cooper, Cozzarelli, & Richards, 1997), greater



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison** (continued)

**Retrospective Studies** (all these studies lacked a preabortion measure of psychological functioning)

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Rue, V.M., Coleman, P.K., Rue, J.J., & Reardon, D.C. (2004). Induced abortion and traumatic stress: Preliminary comparison of American and Russian women. <i>Medical Science Monitor</i> , 10, SR5-16.	217 American women and 331 Russian women ages 18-40 who had had one or more induced abortions and had not experienced other pregnancy losses; recruited in 1994 from a hospital and two outpatient clinics in the U.S. and a hospital in Russia.	Different sets of covariates for different analyses.	Trauma was measured using the 14-item PTSD scale of the Pregnancy Loss Questionnaire. This scale's items correspond to the 14 symptoms of PTSD described in the DSM-IV. The Traumatic Stress Institute's (TSI) Belief scale was used to measure disruptions in beliefs about self and others that arise from exposure to trauma.	American women reported more PTSD symptoms than their Russian counterparts; 14.3% of American and 0.9% of Russian women met full diagnostic criteria for PTSD. Russian women reported more disruption of cognitive schemas. For U.S. women, predictors of poorer psychological adjustment (greater stress-related symptoms) once prior stress and abuse were controlled included being younger, more years of education, having bonded to the fetus, not believing in women's right to have an abortion, feeling pressured to make the decision.	Abortion history retrospectively self-reported. Two groups of women were dissimilar in age, mean number of weeks pregnant etc. Translation problems led to use of different data collection methods (questionnaire in U.S. vs. interview in Russia). Greater rates of behavioral and psychological symptoms in U.S. women may be associated with an environment more conflicted about abortion.
Lemkau, J.P. (1991). Post abortion adjustment of health care professionals in training. <i>American Journal of Orthopsychiatry</i> , 6, 102.	63 women students who were enrolled in degree programs in nursing, professional psychology, or medicine at a Mid-western metropolitan university and acknowledged having had an abortion; they represented 12% of all women students surveyed.	Age, age at abortion, ethnicity, marital status, religion, sexual abuse, gestation time, total number of abortions, etc. entered into regression equation.	Short-term adjustment (STA) was measured as summed ratings (1 = not at all; 4 = moderately; 7 = extremely) of assessed relief, guilt, anger, anxiety, concern about future relationships and concern about future pregnancies three months post abortion. Long-term adjustment (LTA) consisted of the sum of parallel items for the present time, equately described.	Current and 3-month postabortion distress were low, means of all items <4 with the exception of relief (5.5). Perceived preparation for the abortion and confidence in the wisdom of their choice were predictors of STA and LTA. Women who recalled being pressured reported poor STA and LTA and were less confident about the decision they had made.	Abortion history and some measures of postabortion distress retrospectively self-reported. Abortion occurred an average of 9 years previously.



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison (continued)**

**Retrospective Studies (all these studies lacked a preabortion measure of psychological functioning)**

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Congleton, G. K., & Calhoun, L. G. (1993). Post-abortion perceptions: A comparison of self-identified distressed and nondistressed populations. <i>International Journal of Social Psychiatry</i> , 39, 255-265.	25 women who reported responding to abortion with emotional distress compared with 25 non-distressed women. Participants recruited nationally from posted notices and volunteers from NOW, post-abortion support groups, etc.	None.	Mental health assessed via two indices from the Brief Symptom Inventory: the Global Severity Index and the Positive Symptom Distress Index. The Impact of Event scale was used to measure traumatic stress.	The distressed group recalled higher past traumatic stress levels and currently had higher traumatic stress. Neither group showed distress on GSI, and their PSDI scores did not differ.	Small unrepresentative convenience samples. Abortion history retrospectively self-reported. Retrospective self-reports of stress that occurred many years ago. Two groups differed on current religious affiliation.
Tamburrino, M. B., Franco, K. N., Campbell, N. B., Pentz, J. E., Evans, C. L., & Jurs, S. G. (1990). Postabortion dysphoria and religion. <i>Southern Medical Journal</i> , 83, 736-738.	71 women from patient-led support groups for women with post-abortion dysphoria.	None.	Mental health (dysphoria) measured by subscales of the Millon Clinical Multiaxial Inventory.	46% of total group changed their religion to Evangelical and Fundamentalist Protestant denominations. Those who were members of these denominations scored lower on passive-aggressive, ethanol abuse, and avoidance subscales.	Unrepresentative convenience sample limited to women who feel exploited by abortion. Abortion history retrospectively self-reported; psychological reactions after abortion retrospectively reported; some participants had an abortion decades earlier. Non-standardized single item primary outcome measure; age and age range at time of abortion unclear; assume adolescents evidence immature decision making but no evidence to support assumption.

personal conflict about abortion (Cozzarelli, Major, Karrasch, & Fueger, 2000), and low self-efficacy about their ability to cope with the abortion (Cozzarelli, Sumer, & Major, 1998; Cozzarelli, 1993; Major et al., 1990).

This research also provided new insight into the role of cognitive mediators, coping, and stigma in postabortion functioning. Two studies investigated the effects of antiabortion picketing on women's postabortion responses. Cozzarelli and Major (1994) found that the greater the number of antiabortion picketers and the more aggressive the picketing that

women encountered when entering an abortion clinic (as coded by observers), and the more the women reported feeling upset by the demonstrators, the more depressed affect they reported right after their abortion. These effects were partially mitigated by the presence of prochoice escorts outside the clinic, suggesting that prochoice escorts altered not only the social context, but also the meaning of that context. A later study that included 2-year follow-up assessments concluded the women's encounters with picketers evoke short-term negative psychological reactions but do not appear to have long-term negative psychological effects (Cozzarelli et al., 2000).



**Table 5: U.S. Samples of Abortion Group(s) Only/No Comparison (continued)**

**Other**

Citation	Data Source/ Population Studied	Controls/ Covariates	Primary Outcome	Results	Additional Limitations
Layr, S. D., Roberts, C., Wild, K., & Walters, J. (2004). Post abortion grief: Evaluating the possible efficacy of a spiritual group intervention. <i>Research on Social Group Practice</i> , 14, 344-350.	35 women with "post-abortion grief" recruited from three faith-based organizations in Florida.	None.	Postabortion grief composed on shame and post-traumatic stress. Shame is assessed using Cook's Internalized Shame scale; post-traumatic stress measured by the Impact of Events scale-Revised.	Women participated a psychoeducational spiritual-based group intervention for women with postabortion grief offered in an 8-week or weekend format. Shame and post traumatic stress showed significant reductions from pre-intervention to immediately post-intervention.	Small unrepresentative convenience sample. No control/comparison group. No sociodemographic or pregnancy history information other than age. No information on length of time since abortion. No mental health history.

Notes: AB = Abortion; DEL = Delivery; Pg = pregnancy; ACOG = American College of Obstetricians and Gynecologists; ICD = International Classification of Diseases; Grp = Group; Sig = Significance

Examination of perceived stigma revealed that almost half of the 442 women in the multisite sample (Sample 1) felt that they would be stigmatized if others knew about the abortion, and over 45% felt a need to keep it secret from family and friends (Major & Gramzow, 1999). Secrecy was associated with increases in psychological distress (anxiety and depression) over time, via the mediators of increased thought suppression and decreased emotional disclosure. In particular, Major and Gramzow (1999) found that the more women felt that others would look down on them if they knew about the abortion, the more they felt that they had to keep the abortion a secret from their friends or family. Perceived need for secrecy, in turn, was associated with less disclosure of feelings to family and friends, increased thought suppression and intrusion, and increased psychological distress 2 years post abortion (controlling for initial distress). Thus, feelings of stigmatization led women to engage in coping strategies that were associated with poorer adaptation over time.

This research group also extended earlier knowledge about the role of social support in abortion. One study showed that perceived social support mediated the relationship between cognitive models of attachment and adjustment (Cozzarelli et al., 1998). Another study investigated the joint and interactive effects of perceived social conflict and perceived social support from others

surrounding the abortion on negative psychological reactions and well-being (Major et al., 1997). Greater perceived social conflict with the partner predicted increased distress (but not decreased well-being), whereas greater perceived support from partner predicted increased well-being (but not decreased distress). Moreover, for mothers and friends, perceived conflict and support interacted to predict distress, whereas support was a direct predictor of well-being.

Three studies established the importance of cognitive appraisals and self-efficacy as proximal predictors of postabortion adjustment. One study showed that the relationship between social support and adjustment was mediated by coping appraisals and self-efficacy. Women who perceived more social support from others for their decision felt more able to cope with their abortion prior to the procedure, and these appraisals mediated the positive relationship between perceived social support and postabortion well-being (Major et al., 1990). Two other studies showed that self-efficacy and cognitive appraisals mediated the effects of pre-abortion personal resources on postabortion coping and adjustment (Cozzarelli, 1993; Major et al., 1998). Women with more resilient personalities (high self-esteem, internal locus of control, and an optimistic outlook on life) felt more capable of coping with their abortion and appraised it more benignly prior to the procedure. Their more positive cognitive



appraisals, in turn, were associated with more adaptive forms of coping in the month following the abortion (more acceptance, less avoidance), which in turn were associated with reductions in psychological distress (depression, anxiety) and increases in positive well-being over time.

Two studies specifically compared the responses of minor adolescents and adult abortion patients. They reported very similar findings. Using data from Sample 1 of Major et al. (2000), Quinton, Major, and Richards (2001) found no differences between minors ( $N = 38$ ) and adults ( $N = 404$ ) in psychological distress and well-being 2 years after an abortion, although the adolescents were slightly less satisfied with their decision and perceived less personal benefit from it. In a different sample of 96 women (23 adolescents), Pope, Adler, and Tschann (2001) reported that at 4 weeks post abortion, there were no differences in depression, anxiety, self-esteem, or posttraumatic stress between the younger and older groups, although the adolescents scored slightly lower on "comfort with decision." Both of these studies are limited by small samples of adolescents. These results appear to conflict with Major et al. (2000), which identified younger age at time of abortion as a risk factor for negative postabortion emotional experiences. However, the latter study examined the association of mental health outcomes with the continuous variable of age among a larger sample.

Miller (1992) examined psychological experiences subsequent to abortion among 64 women who had participated in a larger longitudinal study on the psychology of reproduction in the San Francisco Bay area in the 1970s. All of the 967 women in the larger study were White, English speaking, and between ages 18 and 27 years. At the final interview, the 64 women who reported an abortion during the study were asked a series of one-item questions about how their abortion had affected them. Prospective analyses using responses from earlier interview periods examined predictors of "regret" (the extent to which women said they would choose the abortion again (1 = *no*, 2 = *not sure*, 3 = *yes*)) and "upset" (how emotionally upset the women recalled being in the first few weeks after the abortion). Having a Protestant religious background was associated with less regret, whereas having a traditional gender role orientation was associated with greater regret. Not being married at the

time of the abortion was related to greater postabortion upset, whereas a traditional gender-role orientation was associated with less upset. Other single items measuring reasons for having and not having an abortion (measured at the final interview) were also related to the two outcome variables. Despite its prospective design, this study is severely limited by the single-item measures of the negative psychological reactions to abortion, retrospective reporting of the emotional impact of the abortion, lack of specification of abortion history, probable underreporting of abortions, small sample, and nonrepresentative sample.

Two other prospective studies examined emotional improvement after mifepristone abortions in minors (Phelps, Schaff, & Fielding, 2001) and depression risk after surgical and nonsurgical abortion (Sit et al., 2007). Phelps et al. assessed emotional responses (e.g., perceived stress, fear) of adolescents aged 14-17 years at three time points: when mifepristone was first administered, 4-8 days later, and 4 weeks later. The researchers found little emotional improvement from first visit to 4-7 days later, but greater emotional improvement (e.g., lower perceived stress, lower fear) at 4-week follow-up. This study was limited by small samples ( $N=35$ ), high attrition rates, and other methodological problems.

Sit et al. (2007) compared depression scores preabortion and 1 month post abortion among women obtaining surgical ( $N = 47$ ) versus nonsurgical (mifepristone-misoprostol) abortions ( $N = 31$ ) at less than 9 weeks' gestation. One month post abortion, 17% (7/42) of surgical and 21% (5/24) of medical patients had an EPDS depression score equal to or greater than 10. Both groups experienced a significant decline in depression from pre- to post abortion, and the difference in depression between the two groups was not significant either before or after the abortion. As observed in other studies, women with a history of past psychiatric problems were at higher risk for postabortion depression, irrespective of procedure. Findings of this study are consistent with several others based on non-U.S. samples in suggesting that method of termination during the first trimester does not affect emotional adjustment or psychological experiences after the procedure among women, given a choice of procedure (Ashok et al., 2005; Howie, Henshaw, Naji, Russell, & Templeton, 1997; Lowenstein et al., 2006).



A final U.S. study (Burgoine et al., 2005) examined depression and grief among 49 women who terminated a desired pregnancy during the second trimester. They examined whether responses differed as a function of the abortion procedure they underwent: dilation and evacuation (D&E) or induction of labor (IOL). Levels of depression were relatively high in both groups 4 months and 12 months post abortion, but incidence of clinically significant depression did not differ as a function of abortion procedure. Grief scores did not differ at 4 or 12 months between women choosing either of the two abortion methods.

### **Retrospective Studies**

Most of the half dozen retrospective studies of abortion samples had serious methodological flaws and do not warrant further discussion except as examples of poor study designs. In these studies women's current or recalled past mental health or distress often was attributed to an abortion that occurred many years previously (e.g., Franz & Reardon, 1992; Lemkau, 1991; Tamburrino et al., 1990). For instance, Lemkau (1991) queried women about their level of distress experienced 3 months post abortion although the target abortion had occurred an average of 9 years previously. Other limitations include use of one-item unstandardized outcome measures (Coleman & Nelson, 1998; Franz & Reardon, 1992) and small sample sizes (Coleman & Nelson, 1998; Congleton & Calhoun, 1993; Tamburrino et al., 1990). Finally, authors of several papers drew conclusions about prevalence of postabortion mental health problems in the general population from samples of women who had self-identified as having postabortion mental health problems, attributed their psychological problems to having had an abortion, and were members of support groups that foster such attributions (Congleton & Calhoun, 1993; Franz & Reardon, 1992; Tamburrino et al., 1990).

### **Summary and Evaluation of Abortion-Only Studies**

Prospective studies of U.S. abortion-only samples have added to knowledge about predictors, mediators, and moderators of psychological experiences subsequent to abortion. The most methodologically strong studies in this group identified personal and social factors that influence how women cognitively appraise and cope with abortion and demonstrated how appraisals and coping processes predict postabortion psychological experiences, both positive and negative. The retrospec-

tive studies in this group suffered from methodological limitations that decreased confidence in the results and limited conclusions that can be drawn from them.

## **SUMMARY AND CONCLUSIONS**

As noted at the beginning of this report, the empirical literature on the association between abortion and mental health has been asked to address four primary questions: (1) Does abortion cause harm to women's mental health? (2) How prevalent are mental health problems among women in the United States who have had an abortion? (3) What is the relative risk of mental health problems associated with abortion compared to its alternatives (other courses of action that might be taken by a pregnant woman in similar circumstances)? and (4) What predicts individual variation in women's psychological experiences following abortion? As discussed above, the first question is not scientifically testable from an ethical or practical perspective. The second and third questions obscure the important point that abortion is not a unitary event, but encompasses a diversity of experiences. That said, in the following section we address what the literature reviewed has to say with respect to the last three questions.

### **The Relative Risks of Abortion Compared to its Alternatives**

The TFMHA identified 50 papers published in peer-reviewed journals between 1990 and 2007 that analyzed empirical data of a quantitative nature on psychological experiences associated with induced abortion, compared to an alternative. These included 10 papers based on secondary analyses of two medical record data sets, 15 papers based on secondary analyses of nine public data sets, 19 papers based on 17 studies conducted for the primary purpose of comparing women who had first-trimester abortions (or an abortion in which the trimester was unspecified) with a comparison group, and 6 studies that compared women's responses following an induced abortion for fetal abnormality to women's responses following other reproductive events. These studies were evaluated with respect to their ability to draw sound conclusions about the relative mental health risks associated with abortion compared to alternative courses of action that



can be pursued by a woman facing a similar circumstance (e.g., an unwanted or unintended pregnancy).

A careful evaluation of these studies revealed that the majority suffered from methodological problems, sometimes severely so. Problems of sampling, measurement, design, and analyses cloud interpretation. Abortion was often underreported and underspecified and in the majority of studies, wantedness of pregnancy was not considered. Rarely did research designs include a comparison group that was otherwise equivalent to women who had an elective abortion, impairing the ability to draw conclusions about relative risks. Furthermore, because of the absence of adequate controls for co-occurring risks, including systemic factors (e.g., violence exposure, poverty), prior mental health (including prior substance abuse), and personality (e.g., avoidance coping style), in almost all of these studies, it was impossible to determine whether any observed differences between abortion groups and comparison groups reflected consequences of pregnancy resolution, preexisting differences between groups, or artifacts of methodology. Given this state of the literature, what can be concluded about relative risks from this body of research?

One approach would be to simply calculate effect sizes or count the number of published papers that suggest adverse effects of abortion and those that show no adverse effects (or even positive effects) of abortion when compared to an alternative course of action (e.g., delivery). Although tempting, such approaches would be misleading and irresponsible, given the numerous methodological problems that characterize this literature, the many papers that were based on the same data sets, and the inadequacy of the comparison groups typically used. Given this state of the literature, the TFMHA judged that the best course of action was to base conclusions on the findings of the studies identified as most methodologically rigorous and sound.

Of the studies based on medical records, the most methodologically rigorous studies were conducted in Finland. The largest and strongest of these examined the relative risk of death within a year of end of pregnancy associated with abortion versus delivery (Gissler et al., 2004b). It demonstrated that the relative risk differs depending on how cause of death is coded. Compared to women who delivered, women who had an abortion had lower rates of direct preg-

nancy-related deaths (cause of death was directly related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes) but higher rates of pregnancy-associated deaths (deaths occurring within one year from end of pregnancy, regardless of whether deaths are pregnancy-related). When therapeutic abortions were excluded from the category of pregnancy-associated deaths, however, this latter difference was not significant. Across both the Medi-Cal and Finland record-based studies, a higher rate of violent death (including accidents, homicide, and suicide) was observed among women who had an abortion compared to women who delivered. This correlational finding is consistent with other evidence indicating that risk for violence is higher in the lives of women who have abortions and underscores the importance of controlling for violence exposure in studies of mental health associated with pregnancy outcome.

With respect to the studies based on secondary analyses of survey data, the conclusions regarding relative risk varied depending on the data set, the approach to the design of the study, the covariates used in analyses, the comparison group selected, and the outcome variables assessed. Analyses of the same data set (the NLSY) with respect to the same outcome variable (depression) revealed that conclusions regarding relative risk differed dramatically depending on the sampling and exclusion criteria applied.

The strongest of the secondary analyses studies was conducted by Fergusson et al. (2006). This study was based on a representative sample of young women in Christchurch, NZ, was longitudinal (although Fergusson also reported concurrent analyses), measured postpregnancy/abortion psychiatric morbidity using established diagnostic categories, and controlled for mental health prior to the pregnancy in prospective analyses. Fergusson et al. compared women who terminated a pregnancy to women who delivered or had not been pregnant. The prospective analyses reported by Fergusson et al. are most informative. These analyses compared number of total psychiatric disorders among women who had an abortion prior to age 21 to number of total psychiatric disorders among women who had delivered a child by age 21 or among women who had never been pregnant by age 21, controlling for prepregnancy mental health and other variables that differed initially among the three



groups. In these analyses, women who had one or more abortions prior to age 21 had a significantly higher number of total psychiatric disorders by age 25 than women who had delivered or had never been pregnant by age 21. This study thus suggests that women who have one or more abortions at a young age (<21) are at greater relative risk for psychiatric disorder compared to women who deliver a child at a young age or women who do not get pregnant at a young age.

There are several reasons why caution should be used in drawing the above conclusion from this study. First and most importantly, Fergusson et al. (2006) did not assess the *intendedness or wantedness* of the pregnancy. As noted earlier, approximately 90% of pregnancies that are aborted are unintended, compared to only 31% of those that are delivered (Henshaw, 1998). Thus, although these were young women, it is reasonable to assume that at least some of the women in the delivery group were delivering a planned and wanted child. Delivery of a planned and wanted child would be expected to be associated with positive outcomes and is not a viable option for women facing an unintended pregnancy. Second, the other comparison group used by Fergusson et al.—women who had never been pregnant—is not a viable option for women already facing an unintended pregnancy. Third, the prospective analyses were based on only 48 women who had abortions, an extremely small sample. Fourth, the study did not control for number of prior abortions or births. Fifth, the study focused on women who had one or more abortions at a young age (< 21 years), limiting its generalizability to younger women; younger age has been linked in some studies to more negative psychological experiences following abortion (e.g., Major et al., 2000). Finally, this study was conducted in New Zealand, a country with more restrictive abortion regulations than those in the United States. Because the focus of APA is on mental health in the United States, it may thus be less useful as a basis for drawing conclusions about relative risks of abortion for U.S. women.

The TFMHA also reviewed and evaluated 19 papers based on 17 studies conducted for the primary purpose of comparing women who had first-trimester abortions (or an abortion in which trimester was unspecified) with a comparison group on a mental health relevant variable. These studies varied widely in methodological

quality and cultural context. Although most of the studies showed no significant differences between the psychological experiences of women who had an induced first-trimester abortion and women in a variety of comparison groups once important covariates (e.g., marital status, age) were controlled, most also were characterized by methodological deficiencies. These included problems of sampling, measurement, design, analyses, and inappropriate comparison groups. Thus, as a group, these studies also do not provide good answers to questions of relative risk or prevalence.

One study, however, stood out from the rest in terms of its methodological rigor. This study was conducted in the United Kingdom by the Royal College of General Practitioners and the Royal College of Obstetricians and Gynecologists (Gilchrist et al., 1995). It was longitudinal, based on a representative sample, measured postpregnancy/abortion psychiatric morbidity using established diagnostic categories, controlled for mental health prior to the pregnancy as well as other relevant covariates, and compared women who terminated an unplanned pregnancy to women who pursued alternative courses of action. In prospective analyses, Gilchrist et al. compared postpregnancy psychiatric morbidity (stratified by prepregnancy psychiatric status) of four groups of women, all of whom were faced with an unplanned pregnancy: women who obtained abortions, who did not seek abortion, who requested abortion but were denied, and who initially requested abortion but changed their mind. The researchers concluded that once psychiatric disorders prior to the pregnancy were taken into account, the rate of total reported psychiatric disorder was no higher after termination of an unplanned pregnancy than after childbirth.

This study provides high-quality evidence that among women faced with an unplanned pregnancy, the relative risks of psychiatric disorder among women who terminate the pregnancy are no greater than the risks among women who pursue alternative courses of action. What appears to be a discrepancy between the conclusions of this study and those of Fergusson et al. (2006) is likely due to differences in sampling and study design. First and most importantly, Gilchrist et al. (1995) restricted their study to women identified by their family doctor as having an “unplanned” pregnancy, whereas Fergusson et al. did not assess the intendedness of the pregnancy, as noted above.



Consequently, the comparison groups used by Gilchrist et al. are more appropriate for addressing the question of relative risk of negative psychological experiences following elective abortion *compared to other courses of action women in similar circumstances (i.e., facing an unplanned pregnancy) might take*. Second, the Gilchrist et al. study was not restricted to women who became pregnant at a young age; hence the sample is more representative of women who seek abortion. Third, differences in abortion sample size were dramatic. The prospective analyses by Gilchrist et al. were based on an abortion sample of 6,410 women, as compared to 48 in the Fergusson et al. study. Fourth, unlike the study by Fergusson et al., the Gilchrist et al. study controlled for number of prior abortions and births. For these reasons, the TFMHA had more confidence in arriving at conclusions about relative risk based on the findings of Gilchrist et al. Nonetheless, it should be noted that the abortion context in the United Kingdom may differ from that in the United States, weakening generalization to the U.S. context.

The TFMHA reviewed six studies that compared women's responses following an induced abortion for fetal abnormality to women's responses following other reproductive events. These studies were based on extremely small samples often characterized by high attrition rates and low response rates. Nonetheless, these studies suggest that terminating a wanted pregnancy, especially late in pregnancy, can be associated with negative psychological experiences comparable to those experienced by women who miscarry a wanted pregnancy or experience a stillbirth or death of a newborn, but less severe than those experienced by women who deliver a child with a severe abnormality. At least one study also suggests that the majority of women who make this difficult choice do not regret their decision (e.g., Kersting et al., 2005). As a group, these studies of responses to termination of a wanted pregnancy for fetal abnormality underscore the importance of considering the wantedness of the pregnancy, as well as the reason for and timing of the abortion, in studying its psychological implications. Interpretation of prevalence of psychological distress and relative risk is clouded when researchers lump together under the category of "abortion" women who abort a wanted pregnancy for reasons of fetal anomaly with women who have an elective abortion of an unplanned and unwanted pregnancy.

In summary, although numerous methodological flaws prevent the published literature from providing unequivocal evidence regarding the relative mental health risks associated with abortion per se compared to its alternatives (childbirth of an unplanned pregnancy), in the view of the TFMHA, the best scientific evidence indicates that the relative risk of mental health problems among adult women who have an unplanned pregnancy is no greater if they have an elective first-trimester abortion than if they deliver that pregnancy (Gilchrist et al., 1995).

The evidence regarding the relative mental health risks associated with multiple abortions is more equivocal. One source of inconsistencies in the literature may be methodological, such as differences in sample size or age ranges among samples. Positive associations observed between multiple abortions and poorer mental health (e.g., Harlow et al., 2004) also may be due to co-occurring risks that predispose a woman to both unwanted pregnancies and mental health problems.

Terminating a wanted pregnancy late in pregnancy due to fetal abnormality appears to be associated with negative psychological experiences equivalent to those experienced by women who miscarry a wanted pregnancy or experience a stillbirth or the death of a newborn.

#### ***Prevalence of Mental Health Problems Among U.S. Women Who Have an Abortion***

A second question this literature has been used to address concerns the prevalence of mental health problems among women in the United States who have had an abortion. As noted at the outset of this report, research capable of adequately addressing this question requires at minimum: (1) a clearly defined, agreed upon, and appropriately measured mental health problem (e.g., a clinically significant disorder, assessed via validated criteria); (2) a sample representative of the population to which one wants to generalize (e.g., women in the United States); and (3) knowledge of the prevalence of the same mental health problem in the general population, equated with the abortion group with respect to potentially confounding factors. None of the studies reviewed met all these criteria and hence provided sound evidence regarding prevalence. Few of the U.S. studies assessed clinically significant disorders with valid and reliable measures or physician diagnosis. In those studies that did use



clinically relevant outcome measures, sampling strategies were inadequate to address the question of prevalence in the larger U.S. population either because the samples were biased, highly selected, geographically restricted, or failed to use appropriate sampling weights. Furthermore, because of the lack of adequate control for co-occurring risks, the extent to which the incidence of mental health problems associated with abortion was due to the procedure versus to potentially confounding factors such as poverty, poorer prior mental health, etc., was impossible to establish.

Given these caveats, however, the prevalence of mental health problems observed among women in the United States who had a single, legal, first-trimester abortion for nontherapeutic reasons appeared to be consistent with normative rates of comparable mental health problems in the general population of women in the United States. Consider, for example, the overall prevalence of depression among women in the NLSY, a longitudinal national survey of a cohort of men and women aged 14–21 years in 1979. Among *all* women in the NLSY, irrespective of reproductive history and without controlling for any covariates, 22% met criteria for depression in 1992 (i.e., scored above the clinical cutoff on the CES-D). Among women who reported one abortion, the corresponding percentage was 23%. Among women who reported multiple abortions, however, the percentage was higher; 31% met criteria for depression (see Table 6).<sup>5</sup> A similar pattern was reported by Harlow et al. (2004) in their study of a representative sample of women in the Boston metropolitan area.

To say that women *in general* do not show an increased incidence of mental health problems following a single abortion, however, does not mean that no women experience such problems. Abortion is an experience often hallmarked by ambivalence, and a mix of positive and negative emotions is to be expected (Adler et al., 1990; Dagg, 1991). Some women experience beneficial outcomes, whereas others experience sadness, grief, and feelings of loss following the elective termination of a pregnancy. Some women experience clinically significant outcomes, such as depression or anxiety. However, the TFMHA reviewed no evidence sufficient to support the claim that an observed association between abortion history and a mental health problem was caused by the abortion per se, as opposed to other factors. As observed throughout this

**Table 6**

Population estimates of proportion of all women and women identified as having been pregnant exceeding CES-D clinical cutoff score, National Longitudinal Survey of Youth: 1992.

Group (N)	CES-D > 15
All women (unweighted N= 4401)	22 %
No abortion ever	21 %
Ever abortion	25 %
One abortion	23 %
Multiple abortions	31 %
All women ever pregnant+ (unweighted N=3503)	23 %
No abortion ever	23 %
Ever abortion	25 %
One abortion	22 %
Multiple abortions	31 %

Notes: +Includes pregnancies ending in miscarriages.  
No covariates are controlled.

report, unwanted pregnancy and abortion are correlated with preexisting conditions (e.g., poverty), life circumstances (e.g., exposure to violence, sexual abuse), problem behaviors (e.g., drug use), and personality characteristics (e.g., avoidance style of coping with negative emotion) that can have profound and long-lasting negative effects on mental health. Differences in prevalence of mental health problems or problem behaviors observed between women who have had an abortion and women who have not may be primarily accounted for by these preexisting and ongoing differences among groups.

#### **Predictors of Individual Variation in Responses Following Abortion**

A third issue addressed in the literature on abortion and mental health concerns individual variation in women's psychological experiences following abortion. The TFMHA reviewed 23 papers based on 15 data sets that were based solely on samples of women who had abortions in the United States, but that otherwise met inclusion criteria. These noncomparison group studies typically focused on predictors of individual variation in response. They were of two major



types: (1) prospective or concurrent studies that usually included preabortion measures of psychological adjustment and risk factors and one or more postabortion assessments of adjustment, and (2) retrospective studies that assessed women's perceived reactions to the event and current level of psychological functioning several years after the abortion. The retrospective studies had serious methodological problems that made interpretation of their findings difficult. The prospective studies, despite limitations of high attrition, geographically limited samples, and potential confounds that were not measured, provided valuable information about sources of variation in individual women's psychological experiences and, to a more limited extent, mental health problems subsequent to abortion.

The most methodologically strong studies in this group showed that interpersonal concerns, including feelings of stigma, perceived need for secrecy, exposure to antiabortion picketing, and low perceived or anticipated social support for the abortion decision, negatively affected women's postabortion psychological experiences. Characteristics of the woman also predicted more negative psychological experiences after first-trimester abortion, including a prior history of mental health problems, personality factors such as low self-esteem and low perceived control over her life, and use of avoidance and denial coping strategies. Feelings of commitment to the pregnancy, ambivalence about the abortion decision, and low perceived ability to cope with the abortion prior to its occurrence also predicted more negative postabortion responses. Across studies, prior mental health emerged as the strongest predictor of postabortion mental health (Major et al., 2000). Type of abortion procedures, at least those used in the first trimester, did not appear to be related to postabortion psychological well-being or mental health.

In considering these risk factors, it is important to recognize that many of the same factors shown to be associated with more negative postabortion psychological experiences also predict more negative reactions to other types of stressful life events, including childbirth (e.g., low perceived social support, low self-esteem, low self-efficacy, avoidance coping). For instance, low perceived social support and low self-esteem also are risk factors for postpartum depression (Beck, 2001; Logsdon & Usui, 2001). Most risk

factors are not uniquely predictive of psychological experiences following abortion. Women characterized by one or more such risk factors might be equally (or more) likely to experience negative psychological reactions if they pursued an alternative course of action (motherhood or adoption).

### **Conclusions and Future Research**

Based on our comprehensive review and evaluation of the empirical literature published in peer-reviewed journals since 1989, this Task Force on Mental Health and Abortion concludes that the most methodologically sound research indicates that among women who have a single, legal, first-trimester abortion of an unplanned pregnancy for nontherapeutic reasons, the relative risks of mental health problems are no greater than the risks among women who deliver an unplanned pregnancy. This conclusion is generally consistent with that reached by the first APA task force (Adler et al., 1990).

This report has highlighted the methodological failings that are pervasive in the literature on abortion and mental health. This focus on methodological limitations raises the question of whether empirical science is capable of informing understanding of the mental health implications of and public policy related to abortion. Some policy questions cannot be definitively answered through empirical research because they are not pragmatically or ethically possible.

Other questions, however, are amenable to the methods of well-designed, rigorously conducted scientific research. For example, empirical research can identify those women who might be more or less likely than others to show adverse or positive psychological outcomes following an abortion. Well-designed research can also answer questions of relative risk and prevalence. What would this research look like?

Such research would use methods that are prospective and longitudinal and employ exacting sampling methods (including the use of sampling weights that allow proper generalization back to the populations to whom the conclusions are being applied). Careful attention would be paid to adequately assessing preexisting and co-occurring conditions such as marital status, domestic violence, age, socioeconomic status, parity, prior mental health, and prior problem behaviors, as well as other situations that are known to be associated with



both differential utilization of abortion and mental health problems. Importantly, comparison groups would be selected so as to be equivalent to the abortion group on all variables other than abortion history. Critical variables such as intendedness and wantedness of the pregnancy would be assessed, and abortion status verified objectively (not only through self-report). Careful use of covariance or similar adjustment techniques (applied to pre-defined covariates) would be employed. Precision of measurement (both in terms of specification of outcome measure and psychometric adequacy of the measurements) would also be guaranteed. Positive psychological responses and experiences as well as negative mental health would be assessed. Repeated assessment of responses over time would be made to assess relevant changes, positive and negative, in the trajectory of responses following abortion. Samples sufficiently large to guarantee adequate power to detect effects that are present would be used, and attention would be paid to effect-size estimation in addition to the simple reliance of null hypothesis statistical testing.

Research that met the above scientific standards would help to disentangle confounding factors and establish relative risks of abortion compared to its alternatives. Even so, there is unlikely to be a single definitive research study that will determine the mental health implications of abortion “once and for all” as there is no “all,” given the diversity and complexity of women and their circumstances. Important agendas for future research are to further understand and alleviate the conditions that lead to unwanted pregnancy and abortion and to understand the conditions that shape how women respond to these life events, with the ultimate goal of improving women’s lives and well-being.



## ENDNOTES

1. In an attempt to assess whether underreporting of abortion might have biased findings in the NLSY, Russo and Dabul (1997) also undertook a reanalysis of the NLSY data to examine whether the relationship between reproductive outcomes and self-esteem held across racial and religious groups known to vary in underreporting, specifically Black versus White and Catholic versus non-Catholic groups. They again found that neither having one abortion nor having repeat abortions was significantly related to RSE when contextual variables were controlled. They also found that the pattern of relationships did not vary by race or religion. This suggests that differential underreporting by some groups did not introduce systematic bias into the results.
2. Personal communication to NFR from David Fergusson, e-mail, 8/8/2007.
3. Although no women in the subgroup with a previous history of DSH were identified as having a postpregnancy psychotic episode, the number of women in that category ( $N = 36$ ) was too small for reliable analysis by reproductive outcome.
4. Personal communication from Ellie Lee.
5. The TFMHA would like to thank K. C. Blackwell for providing these analyses.



## REFERENCES

- Adler, N. E. (1976). Sample attrition in studies of psychological sequelae of abortion: How great a problem? *Journal of Applied Social Psychology*, 6, 240-259.
- Adler, N. E., David, H. P., Major, B. N., Roth, S. H., Russo, N. F., & Wyatt, G. E. (1990). Psychological responses after abortion. *Science*, 248, 41-44.
- Adler, N. E., David, H. P., Major, B. N., Roth, S. H., Russo, N. F., & Wyatt, G. E. (1992). Psychological factors in abortion. *American Psychologist*, 47, 1194-1204.
- Aldwin, C., & Revenson, T. A. (1987). Does coping help? A reexamination of the relation between coping and mental health. *Journal of Personality and Social Psychology*, 53, 337-348.
- American Psychiatric Association. (2002). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision) (DSM-IV-TR). Arlington, VA: Author.
- Ashok, P. W., Hamoda, H., Flett, G. M., Kidd, A., Fitzmaurice, A., & Templeton, A. (2005). Psychological sequelae of medical and surgical abortion at 10-13 weeks' gestation. *Acta Obstetrica et Gynecologica Scandinavica*, 84, 761-766.
- Bailey, P. E., Bruno, Z. V., Bezerra, M. F., Queiroz, I., Oliveira, C. M., & Chen-Mok, M. (2001). Adolescent pregnancy 1 year later: The effect of abortion vs. motherhood in Northeast Brazil. *Journal of Adolescent Health*, 29, 223-232.
- Barber, J. S., Axinn, W. G., & Thornton, A. (1999). Unwanted childbearing, health, and mother-child relationships. *Journal of Health and Social Behavior*, 40, 231-257.
- Barnett, W., Freudenberg, N., & Wille, R. (1992). Partnership after induced abortion: A prospective controlled study. *Archives of Sexual Behavior*, 21, 443-455.
- Bazelon, E. (2007, January 21). Is there a post-abortion syndrome? *New York Times Magazine*, pp. 40-47, 62, 66, 70.
- Beck, C. T. (2001). Predictors of postpartum depression: An update. *Nursing Research*, 50, 275-285.
- Billings, A. G., & Moos, R. H. (1981). The role of coping responses and social resources in attenuating the impact of stressful life events. *Journal of Behavioral Medicine*, 4, 139-157.
- Blascovich, J., Spencer, S. J., Quinn, D., & Steele, C. M. (2001). African Americans and high blood pressure: The role of stereotype threat. *Psychological Science*, 12, 225-229.
- Bolzendahl, C., & Brooks, C. (2005). Polarization, secularization, or differences as usual? The denominational cleavage in U.S. social attitudes since the 1970s. *The Sociological Quarterly*, 46, 47-78.
- Boonstra, H., Gold, R., Richards, C., & Finer, L. (2006). *Abortion in women's lives*. New York: Guttmacher Institute.
- Boyer, D., & Fine, D. (1992). Sexual abuse as a factor in adolescent pregnancy and child maltreatment. *Family Planning Perspectives*, 24, 4-11.
- Bradshaw, Z., & Slade, P. (2003). The effects of induced abortion on emotional experiences and relationships: A critical review of the literature. *Clinical Psychology Review*, 23, 929-958.
- Bradshaw, Z., & Slade, P. (2005). The relationship between induced abortion, attitudes toward sexuality, and sexual problems. *Sexual and Relationship Therapy*, 20, 390-406.
- Breslau, N., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: The 1996 Detroit Area Survey of Trauma. *Archives of General Psychiatry*, 55, 626-632.
- Broen, A. N., Moum, T., Bodtker, A. S., & Ekeberg, O. (2004). Psychological impact on women of miscarriage versus induced abortion: A 2-year follow-up study. *Psychosomatic Medicine*, 66, 265-271.
- Broen, A. N., Moum, T., Bodtker, A. S., & Ekeberg, O. (2005a). The course of mental health after miscarriage and induced abortion: A longitudinal, five-year follow-up study. *BMC Medicine*, 3, 18.



Broen, A. N., Moum, T., Bodtker, A. S., & Ekeberg, O. (2005b). Reasons for induced abortion and their relation to women's emotional distress: A prospective, two-year follow-up study. *General Hospital Psychiatry*, 27, 36-43.

Broen, A. N., Moum, T., Bodtker, A. S., & Ekeberg, O. (2006). Predictors of anxiety and depression following pregnancy termination: A longitudinal five-year follow-up study. *Acta Obstetrica et Gynecologica Scandinavica*, 85, 317-323.

Brown, G. W., & Harris, T. (1978). *Social origins of depression*. New York: The Free Press.

Burgoine, G. A., Van Kirk, S. D., Romm, J., Edelman, A. B., Jacobson, S. L., & Jensen, J. T. (2005). Comparison of perinatal grief after dilation and evacuation or labor induction in second-trimester terminations for fetal anomalies. *American Journal of Obstetrics and Gynecology*, 192, 1928-1932.

Chouinard, E., & Walter, S. (1994). Recall bias in case-control studies: An empirical analysis and theoretical framework. *Journal of Clinical Epidemiology*, 48, 245-254.

Cohan, C. L., Dunkel-Schetter, C., & Lydon, J. (1993). Pregnancy decision making: Predictors of early stress and adjustment. *Psychology of Women Quarterly*, 17, 223-239.

Cohen, S. A. (2006). Abortion and mental health: Myths and reality. *Guttmacher Policy Review*, 9, 8-11, 16.

Coker, A. L. (2007). Does physical intimate partner violence affect sexual health? A systematic review. *Trauma, Violence, and Abuse*, 8, 149-177.

Coleman, P. K. (2006a). Resolution of unwanted pregnancy during adolescence through abortion versus childbirth: Individual and family predictors and psychological consequences. *Journal of Youth and Adolescence*, 35, 903-911.

Coleman, P. K. (2006b). [Testimony in South Dakota Planned Parenthood Minnesota vs. Rounds], No. Civ. 05-4077-KES, 2006 U.S. Dist. LEXIS 72778 (D.S.D. Oct. 4, 2006).

Coleman, P. K., Maxey, C. D., Rue, V. M., & Coyle, C. T. (2005). Associations between voluntary and involuntary forms of perinatal loss and child maltreatment among low-income mothers. *Acta Paediatrica*, 94, 1476-1483.

Coleman, P. K., & Nelson, E. S. (1998). The quality of abortion decisions and college students' reports of post-abortion emotional sequelae and abortion attitudes. *Journal of Social and Clinical Psychology*, 17, 425-442.

Coleman, P. K., Reardon, D. C., & Cougle, J. (2002). The quality of the caregiving environment and child developmental outcomes associated with maternal history of abortion using the NLSY data. *Journal of Child Psychology and Psychiatry*, 43, 743-757.

Coleman, P. K., Reardon, D. C., & Cougle, J. R. (2005). Substance use among pregnant women in the context of previous reproductive loss and desire for current pregnancy. *British Journal of Health Psychology*, 10, 255-268.

Coleman, P. K., Reardon, D. C., Rue, V. M., & Cougle, J. (2002a). A history of induced abortion in relation to substance use during subsequent pregnancies carried to term. *American Journal of Obstetrics and Gynecology*, 187, 1673-1678.

Coleman, P. K., Reardon, D. C., Rue, V. M., & Cougle, J. (2002b). State-funded abortions versus deliveries: A comparison of outpatient mental health claims over 4 years. *American Journal of Orthopsychiatry*, 72, 141-152.

Coleman, P. K., Reardon, D. C., Strahan, T., & Cougle, J. R. (2005). The psychology of abortion: A review and suggestions for future research. *Psychology and Health*, 20, 237-271.

Congleton, G. K., & Calhoun, L. G. (1993). Post-abortion perceptions: A comparison of self-identified distressed and non-distressed populations. *International Journal of Social Psychiatry*, 39, 255-265.

Conklin, M. P., & O'Connor, B. P. (1995). Beliefs about the fetus as a moderator of post-abortion psychological well-being. *Journal of Social and Clinical Psychology*, 14, 76-95.



Cook, E. A., Jelen, T. G., & Wilcox, C. (1992). *Between two absolutes: Public opinion and the politics of abortion*. Boulder, CO: Westview Press.

Cooper, M. L., Wood, P. K., Orcutt, H. K., & Albino, A. (2003). Personality and the predisposition to engage in risky or problem behaviors during adolescence. *Journal of Personality and Social Psychology*, 84, 390-410.

Costa, F., Jessor, R., & Donovan, J. E. (1987). Psychosocial correlates and antecedents of abortion: An exploratory study. *Population and Environment: A Journal of Interdisciplinary Studies*, 9, 3-22.

Cougle, J. R., Reardon, D. C., & Coleman, P. K. (2003). Depression associated with abortion and childbirth: A long-term analysis of the NLSY cohort. *Medical Science Monitor*, 9, CR105-112.

Cougle, J. R., Reardon, D. C., & Coleman, P. K. (2005). Generalized anxiety following unintended pregnancies resolved through childbirth and abortion: A cohort study of the 1995 National Survey of Family Growth. *Journal of Anxiety Disorders*, 19, 137-142.

Cozzarelli, C. (1993). Personality and self-efficacy as predictors of coping with abortion. *Journal of Personality and Social Psychology*, 65, 1224-1236.

Cozzarelli, C., & Major, B. (1994). The effects of anti-abortion demonstrators and pro-choice escorts on women's psychological responses to abortion. *Journal of Social and Clinical Psychology*, 13, 404-427.

Cozzarelli, C., Major, B., Karrasch, A., & Fuegen, K. (2000). Women's experiences of and reactions to anti-abortion picketing. *Basic and Applied Social Psychology*, 22, 265-275.

Cozzarelli, C., Sumer, N., & Major, B. (1998). Mental models of attachment and coping with abortion. *Journal of Personality and Social Psychology*, 74, 453-467.

Crocker, J., Major, B., & Steele, C. (1998). Social stigma. In S. Fiske, D. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (Vol. 2, pp. 504-553). Boston: McGraw-Hill.

David, H. D., Dytrych, Z., & Matejcek, Z. (2003). Born unwanted: Observations from the Prague Study. *American Psychologist*, 58, 224-229.

Dagg, P. K. B. (1991). The psychological sequelae of therapeutic abortion—denied and completed. *American Journal of Psychiatry*, 148, 578-585.

Derogatis, R. L. (1975). *Affect balance scale*. Baltimore: Clinical Psychometrics Research.

Dietz, P. M., Spitz, A. M., Anda, R. F., Williamson, D. F., McMahon, P. M., Santelli, J. S., Nordenberg, D. F., Felitti, V. J., & Kendrick, J. S. (1999). Unintended pregnancy among adult women exposed to abuse or household dysfunction during their childhood. *Journal of the American Medical Association*, 282, 1359-1364.

Dryfoos, J. D. (1990). *Adolescents at risk: Prevalence and prevention*. New York: Oxford University Press.

Dugger, K. (1998). Black women and the question of abortion. In L. J. Beckman & S. M. Harvey (Eds.), *The new civil war: The psychology, culture, and politics of abortion* (pp. 107-132). Washington, DC: American Psychological Association.

Elashoff, J. D. (1969). Analysis of covariance: A delicate instrument. *American Educational Research Journal*, 6, 383-401.

Erickson, P. I., & Kaplan, C. P. (1998). Latinas and abortion. In L. J. Beckman & S. M. Harvey (Eds.), *The new civil war: The psychology, culture, and politics of abortion* (pp. 133-156). Washington, DC: American Psychological Association.

Felton, G. M., Parsons, M. A., & Hassell, J. S. (1998). Health behavior and related factors in adolescents with a history of abortion and never-pregnant adolescents. *Health Care for Women International*, 19, 37-47.

Fergusson, D. M., Boden, J. M., & Horwood, L. J. (2007). Abortion among young women and subsequent life outcomes. *Perspectives on Sexual and Reproductive Health*, 39, 6-12.



Fergusson, D. M., Horwood, L. J., & Ridder, E. M. (2006). Abortion in young women and subsequent mental health. *Journal of Child Psychology and Psychiatry*, 47, 16-24.

Finer, L. B., Frohworth, L. F., Dauphinee, L. A., Singh, S., & Moore, A. M. (2005). Reasons U.S. women have abortions: Quantitative and qualitative perspectives. *Perspectives on Sexual and Reproductive Health*, 37, 110-118.

Finer, L. B., & Henshaw, S. K. (2006a). Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspectives on Sexual and Reproductive Health*, 38, 90-95.

Finer, L. B., & Henshaw, S. K. (2006b). *Estimates of U.S. abortion incidence, 2001-2003*. New York: Guttmacher Institute. Retrieved October 26, 2007, from [http://www.guttmacher.org/pubs/2006/08/03/ab\\_incidence.pdf](http://www.guttmacher.org/pubs/2006/08/03/ab_incidence.pdf)

Franz, W., & Reardon, D. (1992). Differential impact of abortion on adolescents and adults. *Adolescence*, 27, 161-172.

Fu, H., Darroch, J. E., Henshaw, S. K., & Kolb, E. (1998). Measuring the extent of abortion underreporting in the 1995 National Survey of Family Growth. *Family Planning Perspectives*, 30, 128-133.

Gazmararian, J. A., Lazorick, S., Spitz, A. M., Ballard, T. J., Saltzman, L. E., & Marks, J. S. (1996). Prevalence of violence against pregnant women. *Journal of the American Medical Association*, 275, 1915-1920.

Gilchrist, A. C., Hannaford, P. C., Frank, P., & Kay, C. R. (1995). Termination of pregnancy and psychiatric morbidity. *British Journal of Psychiatry*, 167, 243-248.

Gissler, M., Berg, C., Bouvier-Colle, M. H., & Buekens, P. (2004a). Methods for identifying pregnancy-associated deaths: Population-based data from Finland 1987-2000. *Paediatric and Perinatal Epidemiology*, 18, 448-455.

Gissler, M., Berg, C., Bouvier-Colle, M. H., & Buekens, P. (2004b). Pregnancy-associated mortality after birth, spontaneous abortion, or induced abortion in Finland, 1980-2000. *American Journal of Obstetrics and Gynecology*, 190, 422-427.

Gissler, M., Hemminki, E., & Lonnqvist, J. (1996). Suicides after pregnancy in Finland, 1987-94: Register linkage study. *British Medical Journal*, 313, 1431-1434.

Gissler, M., Kauppila, R., Merilainen, J., Toukomaa, H., & Hemminki, E. (1997). Pregnancy-associated deaths in Finland 1987-1994—Definition problems and benefits of record linkage. *Acta Obstetrica et Gynecologica Scandinavica*, 76, 651-657.

Golding, J. M. (1999). Intimate partner violence as a risk factor for mental disorders: A meta-analysis. *Journal of Family Violence*, 14, 99-132.

Greenberg, B. G., Kuebler, R. R., Abernathy, J. R., & Horvitz, D. G. (1971). Applications of randomized response technique in obtaining quantitative data. *Journal of the American Statistical Association*, 66, 243-256.

Grote, N. K., & Bledsoe, S. (2007). Predicting postpartum depressive symptoms in new mothers: The role of optimism and stress frequency during pregnancy. *Health and Social Work*, 32, 107-118.

Harlow, B. L., Cohen, L. S., Otto, M. W., Spiegelman, D., & Cramer, D. W. (2004). Early life menstrual characteristics and pregnancy experiences among women with and without major depression: The Harvard Study of Moods and Cycles. *Journal of Affective Disorders*, 79, 167-176.

Henshaw, S. K. (1998). Unintended pregnancy in the United States. *Family Planning Perspectives*, 30, 24-29, 46.

Hope, T. L., Wilder, E. I., & Terling Watt, T. (2003). The relationships among adolescent pregnancy, pregnancy resolution, and juvenile delinquency. *Sociological Quarterly*, 44, 555-576.



Howie, F. L., Henshaw, R. C., Naji, S. A., Russell, I. T., & Templeton, A. (1997). Medical abortion or vacuum aspiration? Two-year follow up of a patient preference trial. *British Journal of Obstetrics and Gynaecology*, 104, 829-833.

Iles, S., & Gath, D. (1993). Psychiatric outcome of termination of pregnancy for fetal abnormality. *Psychological Medicine*, 23, 407-413.

Jessor, S. L., & Jessor, R. (1977). *Problem behavior and psychosocial development*. New York: Academic Press.

Jones E. F., & Forrest J. D. (1992) Contraceptive failure rates based on the 1988 NSFG. *Family Planning Perspectives*, 4, 12-19.

Jones, R. K., Darroch, J. E., & Henshaw, S. K. (2002a). Contraceptive use among U.S. women having abortions in 2000-2001. *Perspectives on Sexual and Reproductive Health*, 35, 294-303.

Jones, R. K., Darroch, J. E., & Henshaw, S. K. (2002b). Patterns in the socioeconomic characteristics of women obtaining abortions in 2000-2001. *Perspectives on Sexual and Reproductive Health*, 34, 226-235.

Jones, R. K., & Kost, K. (2007). Underreporting of induced and spontaneous abortion in the United States: An analysis of the 2002 National Survey of Family Growth. *Studies in Family Planning*, 38, 187-197.

Jones, R. K., Zolna, M. R. S., Henshaw, S. K., & Finer, L. B. (2008). Abortion in the United States: Incidence and access to services, 2005. *Perspectives on Sexual and Reproductive Health*, 40, 6-16.

Kandel, D. B. (1989). Issues of sequencing of adolescent drug use and other problem behaviors. *Drugs and Society*, 3, 55-76.

Kersting, A., Dorsch, M., Kreulich, C., Reutemann, M., Ohrmann, P., Baez, E., & Arolt, V. (2005). Trauma and grief 2-7 years after termination of pregnancy because of fetal anomalies—A pilot study. *Journal of Psychosomatic Obstetrics and Gynecology*, 26, 9-14.

Kessler, R. C., Avenevoli, S., Merikangas, K. R. (2001). Mood disorders in children and adolescents: An epidemiologic perspective. *Biological Psychiatry*, 49, 1002-1014.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., Wittchen, H. U., & Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry*, 51, 8-18.

Koop, C. E. (1989). *The federal role in determining the medical and psychological impact of abortions on women* (HR No. 101-392, p.14). Testimony given to the Committee on Government Operations, U.S. House of Representatives, 101st Congress, 2nd session, December 11, 1989.

Lauzon, P., Roger-Achim, D., Achim, A., & Boyer, R. (2000). Emotional distress among couples involved in first-trimester induced abortions. *Canadian Family Physician*, 46, 2033-2040.

Lazarus, R. S., & Folkman, S. (1984). Coping and adaptation. In W. D. Gentry (Ed.). *The handbook of behavioral medicine* (pp. 282-325). New York: Guilford.

Lee, E. (2003). *Abortion, motherhood and mental health: Medicalizing reproduction in the United States and Great Britain*. New York: Aldine de Gruyter.

Lemkau, J. P. (1991). Post-abortion adjustment of health care professionals in training. *American Journal of Orthopsychiatry*, 61, 92-102.

Link, B. G., Struening, E. L., Rahav, M., Phelan, J. C., & Nuttbrock, L. (1997). On stigma and its consequences: Evidence from a longitudinal study of men with dual diagnoses of mental illness and substance abuse. *Journal of Health and Social Behavior*, 38, 177-190.

Logsdon, M. C., & Usui, W. (2001). Psychosocial predictors of postpartum depression in diverse groups of women. *Western Journal of Nursing Research*, 23, 563-574.



Lorenzen, J., & Holzgreve, W. (1995). Helping parents to grieve after second-trimester termination of pregnancy for fetopathic reasons. *Fetal Diagnosis and Therapy*, 10, 147-156.

Lowenstein, L., Deutch, M., Gruberg, R., Solt, I., Yagil, Y., Nevo, O., & Bloch, M. (2006). Psychological distress symptoms in women undergoing medical vs. surgical termination of pregnancy. *General Hospital Psychiatry*, 28, 43-47.

Lydon, J., Dunkel-Schetter, C., Cohan, C. L., & Pierce, T. (1996). Pregnancy decision-making as a significant life event: A commitment approach. *Journal of Personality and Social Psychology*, 71, 141-151.

MacNair, R. M. (2005). *Perpetration-induced traumatic stress: The psychological consequences of killing*. New York: Authors Choice Press.

Major, B., & Cozzarelli, C. (1992). Psychosocial predictors of adjustment to abortion. *Journal of Social Issues*, 48, 121-142.

Major, B., Cozzarelli, C., Cooper, M. L., Zubek, J., Richards, C., Wilhite, M., et al. (2000). Psychological responses of women after first-trimester abortion. *Archives of General Psychiatry*, 57, 777-784.

Major, B., Cozzarelli, C., Sciacchitano, A. M., Cooper, M. L., Testa, M., & Mueller, P. M. (1990). Perceived social support, self-efficacy, and adjustment to abortion. *Journal of Personality and Social Psychology*, 59, 452-463.

Major, B., Cozzarelli, C., Testa, M., & Mueller, P. (1992). Male partners' appraisals of undesired pregnancy and abortion: Implications for women's adjustment to abortion. *Journal of Applied Social Psychology*, 22, 599-614.

Major, B., & Gramzow, R. H. (1999). Abortion as stigma: Cognitive and emotional implications of concealment. *Journal of Personality and Social Psychology*, 77, 735-745.

Major, B. N., Mueller, P. M., & Hildebrandt, K. (1985). Attributions, expectations, and coping with abortion. *Journal of Personality and Social Psychology*, 48, 585-599.

Major, B., & O'Brien, L. T. (2005). The social psychology of stigma. *Annual Review of Psychology*, 56, 393-421.

Major, B., Richards, C., Cooper, M., Cozzarelli, C., & Zubek, J. (1998). Personal resilience, cognitive appraisals, and coping: An integrative model of adjustment to abortion. *Journal of Personality and Social Psychology*, 74, 735-752.

Major, B., Zubek, J. M., Cooper, M., Cozzarelli, C., & Richards, C. (1997). Mixed messages: Implications of social conflict and social support within close relationships for adjustment to a stressful life event. *Journal of Personality and Social Psychology*, 72, 1349-1363.

Martino, S. C., Collins, R. L., Ellickson, P. L., & Klein, D. J. (2006). Exploring the link between substance use and abortion: The roles of unconventional-ity and unplanned pregnancy. *Perspectives on Sexual and Reproductive Health*, 38, 66-75.

Mather, M., & Rivers, K. L. (2006). *City profiles of child well-being: Results from the American Community Survey*. Washington, DC: Annie E. Casey Foundation.

McCall, R. B., & Appelbaum, M. I. (1991). Some issues of conducting secondary analyses. *Developmental Psychology*, 27, 911-917.

Medora, N. P., Goldstein, A., & von der Hellen, C. (1993). Variables related to romanticism and self-esteem in pregnant teenagers. *Adolescence*, 28, 159-170.

Mensch, B., & Kandel, D. B. (1992). Drug use as a risk factor for premarital teen pregnancy and abortion in a national sample of young White women. *Demography*, 29, 409-429.

Messer, L. C., Kaufman, J. S., Dole, N., Savitz, D. A., & Laraia, B. A. (2006). Neighborhood crime, deprivation, and preterm birth. *Annals of Epidemiology*, 16, 455-462.

Miller, W. B. (1992). An empirical study of the psychological antecedents and consequences of induced abortion. *Journal of Social Issues*, 48, 67-93.



Moore, K. A. (1995). Executive summary: Nonmarital childbearing in the United States. In U.S Department of Health and Human Services Working Group on Nonmarital Childbearing (Eds.), *Report to Congress on out-of-wedlock childbearing* (DHHS Publication No. PHS 95-1257) (pp. ii-xxii). Washington, DC: Department of Health and Human Services. Retrieved October 20, 2007, from <http://www.cdc.gov/nchs/data/misc/wedlock.pdf>

Mueller, P., & Major, B. (1989). Self-blame, self-efficacy, and adjustment to abortion. *Journal of Personality and Social Psychology*, 57, 1059-1068.

Neugebauer, R., & Ng, S. (1990). Differential recall as a source of bias in epidemiologic research. *Journal of Clinical Epidemiology*, 43, 1337-1341.

Ney, P. G., Fung, T., Wickett, A. R., & Beaman-Dodd, C. (1994). The effects of pregnancy loss on women's health. *Social Science and Medicine*, 38, 1193-1200.

Pallitto, C. C., & O'Campo, P. (2005). Community level effects of gender inequality on intimate partner violence and unintended pregnancy in Colombia: Testing the feminist perspective. *Social Science and Medicine*, 60, 2205-2216.

Phelps, R. H., Schaff, E. A., & Fielding, S. L. (2001). Mifepristone abortion in minors. *Contraception*, 64, 339-343.

Pope, L. M., Adler, N. E., & Tschann, J. M. (2001). Postabortion psychological adjustment: Are minors at increased risk? *Journal of Adolescent Health*, 29, 2-11.

Posavac, E., & Miller, T. (1990). Some problems caused by not having a conceptual foundation for health research: An illustration from studies of the psychological effects of abortion. *Psychology and Health*, 5, 13-23.

Quinton, W. J., Major, B., & Richards, C. (2001). Adolescents and adjustment to abortion: Are minors at greater risk? *Psychology, Public Policy, and Law*, 7, 491-514.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

Reardon, D. C. (2007). *A new strategy for ending abortion: Learning the truth—telling the truth*. Downloaded on January 2008 from <http://www.afterabortion.org>

Reardon, D. C., & Coleman, P. K. (2006). Relative treatment for sleep disorders following abortion and child delivery: A prospective record-based study. *Sleep*, 29, 105-106.

Reardon, D. C., Coleman, P. K., & Cougle, J. R. (2004). Substance use associated with unintended pregnancy outcomes in the National Longitudinal Survey of Youth. *American Journal of Drug and Alcohol Abuse*, 30, 369-383.

Reardon, D. C., & Cougle, J. R. (2002a). Depression and unintended pregnancy in the National Longitudinal Survey of Youth: A cohort study. *British Medical Journal*, 324, 151-152.

Reardon, D. C., & Cougle, J. R. (2002b). Depression and unintended pregnancy in the National Longitudinal Survey of Youth: A cohort study: Reply. *British Medical Journal*, 324, 1097-1098.

Reardon, D. C., Cougle, J. R., Rue, V. M., Shuping, M. W., Coleman, P. K., & Ney, P. G. (2003). Psychiatric admissions of low-income women following abortion and childbirth. *Canadian Medical Association Journal*, 168, 1253-1256.

Reardon, D. C., & Ney, P. G. (2000). Abortion and subsequent substance abuse. *American Journal of Drug and Alcohol Abuse*, 26, 61-75.

Reardon, D. C., Ney, P. G., Scheuren, F., Cougle, J., Coleman, P. K., & Strahan, T. W. (2002). Deaths associated with pregnancy outcome: A record linkage study of low income women. *Southern Medical Journal*, 95, 834-841.

Robins, L., & Regier, D. (Eds.). (1991). *Psychiatric disorders in America: The Epidemiological Catchment Area study*. New York: Free Press.



Rona, R. J., Smeeton, N. C., Beech, R., Barnett, A., and Sharland, G. (1998). Anxiety and depression in mothers related to heart of the child and foetus. *Acta Paediatr* 87, 201-205.

Rosenbaum, E., & Kandel, D. B. (1990). Early onset of adolescent sexual behavior and drug involvement. *Journal of Marriage and Family*, 52, 783-798.

Rosenberg, M. (1965). *Society and adolescent self-image*. Princeton, NJ: Princeton University Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80, Whole No. 609).

Rue, V. M., Coleman, P. K., Rue, J. J., & Reardon, D. C. (2004). Induced abortion and traumatic stress: Preliminary comparison of American and Russian women. *Medical Science Monitor*, 10, SR5-16.

Russo, N. F., & Dabul, A. J. (1997). The relationship of abortion to well-being: Do race and religion make a difference? *Professional Psychology: Research and Practice*, 28, 23-31.

Russo, N. F., & Denious, J. E. (1998a). Understanding the relationship of violence against women to unwanted pregnancy and its resolution. In L. J. Beckman & S. M. Harvey (Eds.), *The new civil war: The psychology, culture, and politics of abortion* (pp. 211-234). Washington, DC: American Psychological Association.

Russo, N., & Denious, J. (1998b). Why is abortion such a controversial issue in the United States? In L. J. Beckman & S. M. Harvey (Eds.), *The new civil war: The psychology, culture, and politics of abortion* (pp. 25-60). Washington, DC: American Psychological Association.

Russo, N. F., & Denious, J. E. (2001). Violence in the lives of women having abortions: Implications for practice and public policy. *Professional Psychology: Research and Practice*, 32, 142-150.

Russo, N. F., & Zierk, K. L. (1992). Abortion, child-bearing, and women's well-being. *Professional Psychology: Research and Practice*, 23, 269-280.

Salvesen, K. A., Oyen, L., Schmidt, N., Malt, U. F., & Eik-Nes, S. H. (1997). Comparison of long-term psychological responses of women after pregnancy termination due to fetal anomalies and after perinatal loss. *Ultrasound Obstetrics and Gynecology*, 9, 80-85.

Schmiege, S., & Russo, N. F. (2005). Depression and unwanted first pregnancy: Longitudinal cohort study. *British Medical Journal*, 331, 1303.

Sit, D., Rothschild, A. J., Creinin, M. D., Hanusa, B. H., & Wisner, K. L. (2007). Psychiatric outcomes following medical and surgical abortion. *Human Reproduction*, 22, 878-884.

Speckhard, A. C., & Rue, V. M. (1992). Postabortion syndrome: An emerging public health concern. *Journal of Social Issues*, 48, 95-119.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69, 797-811.

Strahan T. W. (2001). *Detrimental effects of abortion: An annotated bibliography with commentary*. Springfield, IL: Acorn Books.

Tamburrino, M. B., Franco, K. N., Campbell, N. B., Pentz, J. E., Evans, C. L., & Jurs, S. G. (1990). Postabortion dysphoria and religion. *Southern Medical Journal*, 83, 736-738.

Taylor, J., Henderson, D., & Jackson, B. B. (1991). A holistic model for understanding and predicting depressive symptoms in African-American women. *Journal of Community Psychology*, 19, 306-320.

Taylor, J., & Jackson, B. (1990). Factors affecting alcohol consumption in Black women, Part II. *The International Journal of Addictions*, 25, 1415-1427.

Teichman, Y., Shenhar, S., & Segal, S. (1993). Emotional distress in Israeli women before and after abortion. *American Journal of Orthopsychiatry*, 63, 277-288.



Thorp, J. M., Hartmann, K. E., & Shadigin, E. (2003). Long-term physical and psychological health consequences of induced abortion: Review of the evidence. *Obstetrical and Gynecological Survey*, 58, 67-79.

Torres, A., & Forrest, J. (1988). Why do women have abortions? *Family Planning Perspectives* 20, 169-176.

Trybulski, J. (2006). The long-term phenomena of women's postabortion experiences: Reply to the letter to the editor. *Western Journal of Nursing Research*, 28, 354-356.

Vestal, C. (2006, June 22). *States probe limits of abortion policy* (Updated October 25, 2006). Retrieved January 3, 2007, from <http://www.stateline.org/live/ViewPage.action?siteNodeId=136&languageId=1&contentId=121780>

Williams, G. B. (2001). Short-term grief after an elective abortion. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 30, 174-183.

Willoughby, T., Chalmers, H., & Busseri, M. A. (2004). Where is the syndrome? Examining co-occurrence among multiple problem behaviors in adolescence. *Journal of Consulting and Clinical Psychology*, 72, 1022-1037.

Wilmoth, G. H., de Alteriis, M., & Bussell, D. (1992). Prevalence of psychological risks following legal abortion in the U.S.: Limits of evidence. *Journal of Social Issues*, 48, 37-65.

Zeanah, C. H., Dailey, J. V., Rosenblatt, M. J., & Saller, D. N., Jr. (1993). Do women grieve after terminating pregnancies because of fetal anomalies? A controlled investigation. *Obstetrics and Gynecology*, 82, 270-275.



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